CONJOINT ANALYSIS OF VALUES OF RESERVE COMPONENT ATTRIBUTES

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This is a study of the male enlistment market for Reserve Component service. It reports the impact of various configurations of attributes on the decision to join or not to join the Reserve Components.

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TABLE OF CONTENTS

Table of Contents (continued)

Table of Contents (continued)

INTRODUCTION

The rationale for conducting this study as well as the objectives and survey design are described below.

The Reserve Components are facing declining strengths because of an inability to attract and retain people. Faced with this situation, the Reserve Components have been engaged in a major marketing-like effort to recruit and retain high quality personnel. This effort is necessary since young men have a large number of potential careers and activities to pursue. The marketing environment is complex, because there are many attributes of careers and activities that may be of greater or lesser importance, such as salary, fringe benefits, opportunity for education, travel, image of the job/activity and employer and so on. In order for the Reserve Components to be competitive in this environment, it is necessary to engage in activities such as marketing research, advertising, and promotion that have been successfully used with other products and services.

With the above as background, the Department of Defense requested that a comprehensive research study be undertaken to indicate to the Reserve Components what actions in the form of product modification and/or product communications are likely to have the greatest impact on increasing (1) accessions among various demographic types of NPS civilian males and (2) likelihood of re-enlistment among current guardsmen and reservists. Hence, the overall objective of the study is to examine in detail motivational factors in enlistment and retention as a basis for developing policy recommendations for efforts aimed at enhancing Reserve Component accession and retention.

The information gathered in this study has several specific objectives. The first objective is to measure young men's propensity to serve (or re-enlist) in the Reserve Components.

The second objective is to determine current perceptions of the Reserve Components in terms of 12 key attributes.

A third objective is to determine the relative importance of the 12 key job attributes that may provide the basis for influencing young men to join and remain in the Reserve Components.

Finally, this study provides a simulation model that indicates what configurations of job characteristics, benefits and incentives will enhance (1) accessions and (2) re-enlistment intentions among various target groups (e.g., high school graduates, etc.).

Study Design

In order to meet these objectives, Market Facts, Inc. conducted a survey among two different samples of individuals. The first sample consisted of 17-26 year old males who do not have prior or current military involvement and who are not beyond their second year of college. In total, 1,371 interviews were completed with non-prior service (NPS) civilian males. The second sample consisted of 217 current reservists and guardsmen; grades E-4 to E-7 in their first six-year term of service. These two samples are treated entirely separately in this report since they address two different manning problems, accessions and retention.

The interviewing for this study took place between July 7, 1977 and August 31, 1977.

The survey employed a computer-based interactive system of interviewing. Each respondent was seated at a video display device (Cathode Ray Tube) on which questions were presented and with which he interacted by use of a simple response keyboard. The sample of NPS civilians was selected according to a quota sampling procedure. This procedure is discussed in Appendix I. The Department of Defense provided a randomly drawn list of reservists and guardsmen for the sample of current reservists and guardsmen.

The study was conducted in nine geographic markets in which Reserve Component units are located. These markets, representing a wide cross-section of population density and geographic location, were as follows:

Large Urban Areas

- Boston, Massachusetts
- Chicago, Illinois
- San Francisco, California

Small Urban Areas

- Billings, Montana
- Chattanooga, Tennessee
- Pittsfield, Massachusetts
- Rockford, Illinois
- Stockton, California
- Victoria, Texas

To develop the simulation model, a technique called Trade-Off Analysis was used. An overview of this procedure is provided below and a more detailed discussion appears in the Appendix IV.

Many alternative programs might be adopted by the Reserve Components to attract high quality recruits and encourage current reservists and guardsmen to remain in the service beyond their initial six-year term. However, these alternative programs might entail substantial differences in cost or difficulty in implementation. Similarly, individuals also have preferences when considering attributes such as salary and educational assistance and the like. Thus, in arriving at an optimum combination of programs, we must consider trade-offs among cost, difficulty of implementation, and likelihood of acceptance by potential recruits and those who may choose to re-enlist. The cost and difficulties of implementation can be estimated with reasonable accuracy for a variety of program combinations but the acceptability to potential recruits cannot be adequately quantified by traditional attitude and awareness measurement procedures.

Most people would like to follow career paths that involve high salaries without responsibilities, excitement without risk, and security without tedium. In the real world, such possibilities rarely exist and, in making a career choice, it is necessary to consider the trade-offs among a number of career attributes. One survey technique specifically designed for such situations is Trade-Off Analysis. The basic procedure for Trade-Off Analysis is as follows.

In conjunction with the Department of Defense, 12 attributes were developed that describe various key characteristics of the Reserves and National Guard. Attributes were chosen that could be manipulated or modifed to varying levels by the services as a means of creating inducements for accession and retention. These attributes are the essence of Trade-Off Analysis. The attributes and the levels investigated are presented below.

Attributes Studied With The NPS Civilian Sample

1. Starting Pay:
   - $4.24 per hour
   - $3.40 per hour
   - $2.84 per hour
   - $2.28 per hour

2. Initial Term of Service:
   - 4 years
   - 6 years
   - 8 years

3. Enlistment Bonus:
   - $3,000
   - $1,000
   - $300
   - None

4. Educational Assistance:
   - 100% coverage of educational costs up to $1,000 per year for four years
   - 100% coverage of educational costs up to $500 per year for four years
   - 50% coverage of educational costs up to $500 per year for four years
   - No educational coverage

5. Federal Income Tax Deduction:
   - Military pay is tax free
   - Military pay is not tax free

6. Post/Base Exchange (PX/BX) and Commissary Privileges:
   - PX/BX and commissary available all the time for self and family
   - PX/BX and commissary available when on duty for self and family
   - PX/BX and commissary available when on duty for self only

7. Hair Regulations:
   - No regulations on hair length
   - Your hair must look short for meetings; short haired wigs o. k.
   - Your hair must be short. No wigs permitted

8. Hours of Meetings Each Month:
   - 12 hours of meetings per month
   - 16 hours of meetings per month

9. When Unit Meetings Are Held:
   - 1 session/month taking 2 days in one weekend
   - 2 sessions/month taking 2 different Saturdays
   - 3 sessions/month taking 1 Saturday and 2 weekend evening

10. What Is Done At Unit Meetings:
   - 50% military training, 50% community service
   - 75% military training, 25% community service
   - 100% military training

11. Retirement
   - Retire after 20 years of service and receive about $235/month plus benefits at age 60
   - Retire after 30 years of service and receive about $235/month plus benefits at age 50
   - Receive no retirement pay or benefits

12. Annual Two Week Training:
   - Annual training during vacation. You get military plus civilian pay
   - Annual training not during vacation. You get military plus civilian pay
   - Annual training not during vacation. Employer makes up pay difference
   - Annual training not during vacation. You get only military pay

A 13th attribute was branch of service:

- Air Force
- Army
- Marine Corps
- Navy

Attributes Studied With the
National Guard/Reserve Sample

1. E-4 Pay (4-6 years service):
   - $1,749 per year (50% over current level)
   - $1,399 per year (20% over current level)
   - $1,166 per year (current level)
   - $933 per year (20% below current level)

   E-5 Pay (4-6 years service):
   - $1,844 per year (50% over current level)
   - $1,475 per year (20% over current level)
   - $1,229 per year (current level)
   - $983 per year (20% below current level)

   E-6 Pay (4-6 years service):
   - $2,032 per year (50% over current level)
   - $1,626 per year (20% over current level)
   - $1,355 per year (current level)
   - $1,084 per year (20% below current level)

   E-7 Pay (4-6 years service):
   - $2,296 per year (50% over current level)
   - $1,837 per year (20% over current level)
   - $1,531 per year (current level)
   - $1,225 per year (20% below current level)

2. Length of Re-enlistment:
   - Re-enlistment term of 1 year
   - Re-enlistment term of 3 years
   - Re-enlistment term of 6 years

3. Re-enlistment Bonus:
   - $3,000 re-enlistment bonus
   - $1,000 re-enlistment bonus
   - $300 re-enlistment bonus
   - No re-enlistment bonus

4-12 (SAME AS CIVILIAN)

Each respondent was presented with a series of pairwise comparisons of attributes. A typical pairwise question was presented in a format like the following.

Which would you prefer . . .

A 4 year enlistment term and a $1,000 bonus	OR	A 6 year enlistment term and a $3,000 bonus

In this manner, each respondent indicated his preference for pairs of attributes. The preference data are analyzed by a proprietary computer program that translates these preferences into numbers referred to as utilities. The utility associated with each level of each attribute is a numerical indication of the value or importance which the respondent attaches to that attribute level. These utilities are the basis upon which computer simulations have been conducted to investigate the effect on accessions and re-enlistment intentions of changing various attributes and combinations of attributes by specific amounts.

The Accessions Model

In this study we are attempting to estimate actual behavior (i.e., accessions) from a study of attitudes and preferences of the survey respondents. Traditionally, estimates are made on the basis of econometric models. While such models have their value, they are normally used in forecasting future accession rates for the current set of attribute levels. Since the focus of the present research is on estimation of accession levels for different sets of attribute levels (for which no market data exist), it is necessary to include measures of the attitudes and values of NPS men in the estimation model.

The data collection method used in the main part of this study requires only that the respondent make simple preference judgments. Unlike traditional attitude measurement methods, the respondent is not required to say how important a particular attribute is to him, but only whether one combination of attributes is more desirable than another. The computer-based method used to collect data permits us to choose a particular set of questions to ask each respondent so as to sharply define his own unique values, and a set of numbers results which express how valuable he perceives each attribute level to be.

Trade-Off Analysis has been used on a large number of occasions in marketing research to learn the relative perceived values of product attributes, and there is little doubt about its ability to do this successfully. For example, if we learn that an individual places more value on an additional thousand dollars per year of pay than on expanded PX/BX/Commissary privileges, we can state with some confidence that higher pay is more likely to cause him to join the military than a change in PX/BX/Commissary privileges.

However, in this study we have attempted to go beyond the measurement of relative importances of various attributes, and to make estimates of actual accession levels which would occur given any change in attributes of the military "job". This task is much more difficult since it involves not only measuring preferences between different collections of attribute levels, but also the estimation of likelihoods of future actions. People are not very good predictors of their future behavior, and consequently the actual levels of accessions predicted will have considerably more uncertainty surrounding them than the conclusions about the relative strength of various combinations of attribute levels.

Content of Interview

The interview focused on the following areas of information:

(1) Respondent demographics

- Age
- Marital status
- Racial/ethnic affiliation
- Education
- Employment
- Socio-economics of parent's household
- Reserve component status (Military respondents only)
  - Pay grade
  - Component
  - Length of service
  - Job

(2) Propensity to enlist/re-enlist in the Reserve Components

(3) Perception of the Reserve Components on 12 Attributes

(4) Trade-off of paired attributes

(5) Estimates of likelihood of enlisting (re-enlisting) under various conditions

(6) Satisfaction with Reserve Components (Military respondents only)

(7) Achievability of life goals in the Reserve Components (Military respondents only)

Overview of Study Analysis

The decision to join or remain in the Reserve Components is contingent, in part, on at least two general factors: how the individual currently spends his time (e.g., employment, education, etc.) and his attitudes towards the Reserve Components based on his perceptions of these services.

Both factors, in turn, have several ramifications with respect to serving in the Reserve Components. How an individual spends his time affects both his desire and need for additional activities as well as his ability to pursue other activities.

His attitudes toward the Reserve Components reflect both the individual's psychological (e.g., serving one's country, associating with others, keeping busy, etc.) and his economic needs.

Any attempts to estimate accessions and re-enlistment intentions must consider both factors. Hence, the analysis and reporting of this study has been couched in the framework of these two factors.

Insofar as the sample of NPS civilian males and the sample of current reservists and guardsmen represent two very different populations and two distinct problems, the data derived from these two samples have been analyzed and reported separately. With respect to implications for recruiting strategy development, however, conclusions drawn from both samples have been integrated and are discussed in the Executive Summary.

With the above as background, this report begins with a discussion of NPS civilian males; how they currently spend their time with respect to employment and education, their stated likelihood of serving in the Reserve Components, their perceptions of the Reserve Components in terms of 12 attributes, the relative importance (utility) they attach to each of these 12 attributes, and the impact various configurations of attributes are likely to have on their decision to join or not join the Reserve Components.

A discussion of current reservists and guardsmen follows the discussion of NPS civilian males. Similar issues are addressed; how reservists and guardsmen spend their time with respect to employment and education, the nature of their military service, their relative likelihood of re-enlisting, their perceptions of the Reserve Components in terms of various attributes, the relative importance they attach to each attribute, and the impact various configurations of attributes are likely to have on their intentions to re-enlist.

In such a large study, many results are likely to appear which are due solely to chance or sampling variance. In order to avoid being deceived by such results, the analysis of the data delineates those results which are unlikely to be due to chance or sample idiosyncrasies. Specifically, all significance statements are based on the 95% confidence level. This means there is less than a 5% chance that such a result would occur solely due to chance.

The quota sampling procedure used in this study necessitates that the collected data be weighted in order for us to make valid estimates of national statistics. The procedure for weighting the data is discussed in Appendix II.

Finally, the body of the report discusses conclusions. Technical issues pertaining to data collection and analysis are discussed in the appropriate appendices which are referenced throughout the report.

EXECUTIVE SUMMARY

Introduction

This report is a discussion of motivational factors in enlistment and retention in the Reserve Components. The study provides guidance for recruiting and retention strategy development by examining the relative impact on accessions and re-enlistment intentions of various configurations of job characteristics, benefits and incentives. A total of 1,371 non-prior service (NPS) civilian males between 17 and 26 years of age were interviewed in nine geographic markets using a computer-based interactive system of interviewing. In addition, 217 current guardsmen and reservists, grades E-4 to E-7 in their first six-year term of service, were interviewed. The two samples are treated entirely separately in this study since they address two different manning problems, accessions and retentions.

Major Conclusion of the Study of NPS Civilians

NPS civilians tend to view various types of large financial benefits as the most important factors in making a decision to join the Reserve Components. Educational assistance, enlistment bonus, and increased starting pay are likely to have the greatest impact on increasing accessions. Other financial or quasi-financial attributes are among the less powerful or important attributes. PX/BX/Commissary privileges, military pay being tax free, and annual training vacation arrangements could all affect the real income of reservists, at least to some degree, but their impact on accessions can be expected to be relatively small. Factors related to the impact of Reserve Component membership on lifestyle (i.e., frequency of meetings, length of meetings per month, hair regulations) are likely to have relatively little impact on accessions.

It is estimated that modifying the Reserve Components in terms of various levels of any one or more of the three most important attributes could enhance accessions by 50% or more. The decision regarding which modifications to make, however, depends not only on candidates' preferences but also on economic and logistic considerations. The

present study offers guidance by providing the Department of Defense with a mathematical and psychological model that permits simulation of product modifications and estimation of the resulting level of accessions of (1) NPS men in total or (2) men with certain demographic characteristics.

Propensity to Join the Reserve Components

In total, 17.9% of the NPS men expressed positive propensity (i.e., said that they "definitely" or "probably would" serve) for the Reserve Components. Approximately one-in-seven (14.5%) young men rated themselves as possible entrants into the Army Reserve, Air Force Reserve, Naval Reserve, Marine Corps Reserve and/or Coast Guard Reserve. One-in-twelve (8.2%) respondents expressed propensity to join the Army National Guard and/or Air National Guard.

The overall rank order of the components based on expressed propensity levels was as follows:

-Army National Guard	5.5%
-Air Force Reserve	5.5%
-Army Reserve	5.3%
-Naval Reserve	4.8%
-Coast Guard Reserve	4.6%
-Air National Guard	4.4%
-Marine Corps Reserve	3.3%

Demographic Profile of Positive Propensity Men

Those men who expressed a positive propensity for the Reserve Components, in contrast to negative propensity men, tend to be . . .

- More likely to be Non-White
- More likely to still be in high school
- Less likely to have had a college preparatory curriculum in high school
- More likely to have had a vocational curriculum in high school
- Less likely to be in college

-More likely to be currently unemployed

-Less likely to be in white collar occupations, if employed

-Less likely to be from a large urban area

This profile tends to underscore the importance these individuals attach to economic benefits. For these individuals, the Reserve Components may be an important means by which they can advance themselves in terms of education and occupation.

Perceptions of the Reserve Components

NPS men were asked what they believe the Reserve Components presently offer in terms of job characteristics, benefits and incentives. Respondents were asked to indicate what they believed was the current level for each of twelve attributes. The majority of these men perceived each of these attributes to be characterized by higher than actual levels. With respect to recruiting strategy development, these favorable misperceptions suggest that the Reserve Components need to concentrate their recruiting strategy development efforts primarily on the more difficult task of product improvement rather than improvement of communications.

Major Conclusion of the Study of Current Guardsmen and Reservists

The most important attributes with respect to enhancing re-enlistment intentions appear to be similar to those that are likely to have the largest impact on accessions of NPS men. A re-enlistment bonus and educational assistance are likely to have the greatest positive impact on re-enlistment intentions of current guardsmen and reservists. Tax-free military pay, length of extension of service, and increased pay also appear to be important factors in making a decision to re-enlist. Factors related to the impact of Reserve Component membership on lifestyle such as timing of annual training, hair regulations and length of meetings per month appear to be of relatively little importance in the re-enlistment decision for current guardsmen and reservists.

The estimated likelihood of re-enlisting could be increased by 30% or more by modifying the Reserve Components in terms of various levels of any one or more of the following attributes: re-enlistment bonus, educational assistance, level of pay, tax benefits and extension of service.

The simulation model enables the Department of Defense to examine potential for increases in re-enlistment intentions for various configurations of job characteristics, benefits and incentives among (1) current guardsmen and reservists in total and (2) those men with certain demographic characteristics.

Propensity to Re-enlist in the Reserve Components

In total, 35.1% of the current guardsmen and reservists said that they "definitely" or "probably would" re-enlist. Another 15.2% were undecided. One-half of the men intending to re-enlist planned to do so for no more than one year. The average was just just over two years.

Demographic and Attitudinal Profile of Men Intending to Re-enlist

Those men who said that they "definitely" or "probably would" re-enlist (positive propensity), in contrast to negative propensity men, tend to be...

- More likely to be Non-white
- Less likely to be a college graduate
- Less likely to be in a white collar occupation
- More likely to be in a higher grade (E-6 and E-7)
- More likely to see the Reserve Components as enabling the achievement of life goals
- More likely to be satisfied with the Reserve Components

Perceptions of the Reserve Components

Most guardsmen and reservists appear to be quite well informed about what the Reserve Components presently offer in the way of job characteristics, benefits and incentives. Efforts aimed at increasing retention should be concentrated, therefore, on first providing an enhanced product, rather than on product communications.

NON-PRIOR SERVICE

CIVILIANS

SECTION I

Analysis of Demand on Time: Employment and Educational Involvement

For most, membership in the Reserve Components is not a primary pursuit. Rather, it represents another activity in addition to one's primary vocation. In deciding whether or not to join the Reserve Components, a young man must take into consideration his present or anticipated employment and education situations. Specifically, he must consider his motivations for joining within the framework of the degree to which his employment and/or education situations (e.g., availability of time, employer cooperation, etc.) enable him to pursue an additional activity such as being a National Guardsman or Reservist.

As a means of providing background to and understanding of the intentions of civilian non-prior service males with respect to serving in the Reserve Components a discussion of their current employment and educational involvement follows. The issue is the extent to which time is available to the individual to participate in the National Guard and Reserves.

1.1 Level of Employment

As Table 1.1 shows, 60% of the males interviewed in this study reported that they were currently employed, the majority of them in full time occupations. The balance reported being not employed.

Table 1.2 shows that 68% of employed respondents reported holding blue collar occupations; many of them in service (e.g., policeman, postman, deliveryman, etc.) occupations. Department of Defense data on enlistees as well as attitudinal studies such as the Youth Attitude Tracking studies indicate that individuals from higher socio-economic groups are less likely to join the all-volunteer forces. Occupational status is one indicator of socio-economic standing. The extent to which it is a discriminating variable with respect to propensity to serve in the Reserve Components is examined in Section III.

TABLE 1.1

REPORTED LEVEL OF EMPLOYMENT

	TOTAL %
Employed	60.1
Full-time	38.8
Part-time	18.2
Both full-time and part-time	3.1
Not employed	39.9
BASE	(1371)

TABLE 1.2

OCCUPATION

	TOTAL %
White Collar	31.9
Professional/technical	7.4
Manager/proprietor	9.0
Sales	7.9
Clerical	7.6
Blue Collar	68.1
Craftsman/skilled labor	13.7
Machinery operator	8.1
Service worker	29.0
General laborer	17.3
BASE	(824)

I.2 Employment and Educational Involvement

It is not uncommon for a man in the 17-26 year-old age group to both work and attend school. Being both employed and enrolled in school tends to limit a person's ability to pursue additional activities.

Table I.3 summarizes the degree to which respondents are both employed and going to school. One third of the sample indicated that they work and go to school. At the other extreme, 22% said that they neither work nor go to school.

TABLE 1.3

LEVEL OF EMPLOYMENT COMBINED WITH EDUCATIONAL INVOLVEMENT

	TOTAL %
Employed and attend school	35.0
Employed only	25.1
Not employed and attend school	17.9
Not employed and do not attend school	22.0
BASE	(1371)

1.3 Derived Demand on Time

A young man's likelihood of joining the Reserve Components is contingent, in part, on the demands placed on his time. The most objective measure of demand on time is the number of hours worked each week. The concept of demand on time, however, also has a subjective element -- what the individual perceives the demand on his time to be. This perception, in part, may be a function of both the nature and degree of the individual's work-related commitments. These include whether his work is full time or part time, the number of jobs held, and whether he also attends school. Compared to someone who has a part time job, a person who holds a full time job may feel he has more of a commitment to his work and, therefore, has less time to pursue other activities. This may be this person's perception, despite the fact that both individuals work the same number of hours each week.

The following example further illustrates the objective and subjective nature of the concept of demand on time. The major weekly activities of four people are described below.

Person A	Person B	Person C	Person D
. Works 40 hours . Holds 1 full-time job . Attends school	. Works 40 hours . Holds 2 part-time jobs	. Works 40 hours . Holds 1 full-time job	. Works 40 hours . Holds 1 part-time job

All four individuals work the same amount of hours each week. However, they may perceive the demand on their time differently. In addition to his one full time job, Person A also attends school. He physically has more demands placed on his time than do the other individuals. Person B may perceive the demand on his time to be high, while Person C and Person D do not. Person B's perception of his situation is based on his commitment to two jobs rather than one. Like Person C, Person D works 40 hours each week at one job. In contrast, however, Person D's job is only temporary (i.e., part time). This may lead Person D to view the demand on his time to be less than what Person C perceives his time availability to be.

As a means of gauging this demand, an index of demand on time was created by asking the individual to report several areas of employment information -- employed full time or part time, number of jobs held, number of hours worked per week on all jobs. In addition, the index is based on whether or not the respondent is in school. The index ranges from a low of 2 to a high score of 16. For purposes of discussion, the scale has been divided into three groups:

Demand on Time	Scale Scores	Typical Description
High	11-16	•Work 2+ jobs, •40+ hours a week •May also attend school
Medium	7-10	•Work 1 full time job •About 40 hours a week •May also attend school
Low	2-6	•May work 1 part time job •Less than 20 hours a week •May attend school instead of work

Table 1.4 explains the derivation of the demand on time index.

TABLE 1.4

(Employment)	Value	(Number of Jobs)	Value	(Total Hours Worked in Week)	Value	(In School)	Value
Full time	3	Four or more	4	61+	7	Yes	2
Part time	2	Three	3	51-60	6	No	1
None	1	Two	2	41-50	5		
		One	1	31-40	4		
		None	0	21-30	3		
				11-20	2		
				1-10	1		
				0	0		

Table 1.5 shows that 15.8% of the respondents reported having a relatively high demand on their time during an average week. In general, these people are typically holding more than one job or are working full-time plus going to school. As such they are working and perhaps attending school more than 40 hours a week.

TABLE 1.5

DEMAND ON TIME

	TOTAL %
High	15.8
Medium	45.5
Low	38.7
BASE	(1371)

I.4 Characteristics of Employment

Typically, a person works at one full time job for 35 to 40 hours a week. For many this is sufficient to meet their economic as well as work-related psychological needs. The extent to which people exceed this standard raises questions as to what motivates them to pursue additional work. To a large extent their motivations may reflect an inability to fulfill their economic and psychological needs from one full time activity. As a source of activity and economic benefits, the National Guard and Reserves could provide one means to fully satisfy these needs.

The issue is not only the question of time availability to participate in activities such as the National Guard and Reserves, but whether the Reserve Components as an activity offers what individuals are seeking.

With this in mind, employed respondents were asked a series of questions with respect to the number of jobs held, hours worked in an average week and average weekly compensation from all jobs. Table I.6 profiles these key employment characteristics. Respondents who reported holding more than one job were asked their reasons for multiple employment. Their reasons are presented in Table I.7.

The data shown in these two tables can be summarized as follows:

1. NPS civilians reported, on the average, working a normal 35-40 hour week, although 12% reported working 50 or more hours.

2. On the average, these men reported earning modest incomes ($139 per week or approximately $7,200 per year). Only 8.7% said they are earning in excess of $15,000 per year, a relatively high income.

3. Nineteen percent of the working respondents said that they hold more than one job. Their motivations were primarily economic and future-oriented in their perspective: save for the future, earn tuition for school and earn extra money to buy something special. Psychological reasons such as associating with others and filling one's time also were mentioned frequently.

TABLE 1.6

KEY CHARACTERISTICS OF EMPLOYMENT

	TOTAL %
Average number of hours worked per week on all jobs	36.7 hours
Percent who work more than 50 hours per week	12.1%
Average income per week from all jobs	$139.00
Percent who earn $300 or more per week	8.7%
Percent holding more than one job	19.1%
BASE	(824)

TABLE 1.7

MAJOR REASONS FOR HOLDING
MORE THAN ONE JOB

	TOTAL %
Save for the future	37.3
Earn tuition for school	36.8
Earn extra money to buy something special	32.4
Meet regular household expenses	26.6
Pay off debts	25.1
Keep busy	24.1
Be with other people	18.5
BASE	(166)

*Multiple mentions

In summary, the modest economics of the employment of NPS respondents would suggest that they may have a serious need for additional income of some sort. The fact that one-in-five work more than one job, primarily for economic reasons, tends to underscore this possibility. Moreover, from the standpoint of time availability, the employment of these men does not appear to be overly demanding.

All in all, there appears to be considerable correspondence between the employment characteristics of the target market group surveyed in this study and the time demand and benefits associated with participation in the Reserve Components.

1.5 Perceived Difficulty of Obtaining Employment

Labor market factors can be expected to have an effect on Reserve Component enlistments as they do for the active duty services. People's impressions of the job market may have a greater role in career choice than the actual labor situations. For this reason respondents were asked their perceptions of the job market in their respective areas, both how difficult they felt it was to (1) get a full time job and (2) get a part time job.

Table 1.8 summarizes respondents' perceptions of the market for full time jobs. Nationwide, 37.9% of the sample felt that for a person their age getting a full time job in their area was very difficult or almost impossible. One-half (50.2%) of the sample felt that it was somewhat difficult and the balance felt that it was not difficult at all. Respondents living in large urban areas (i.e., Boston, Chicago and San Francisco) were more pessimistic than others about finding full time employment in their areas.

Table 1.9 summarizes respondents' perceptions of the market for part time jobs. Nationwide, only 23.1% of the sample felt that it was almost impossible or very difficult for someone their age to find part time employment. Almost one-half (47.9%) felt that it was somewhat difficult. Young men living in large urban areas were no different from their counterparts in small urban areas with respect to their perceptions of finding part time employment. All in all, young men appear to be somewhat more pessimistic about finding full time employment than they are with respect to finding part time employment.

TABLE 1.8

PERCEIVED DIFFICULTY OF OBTAINING FULL TIME JOB IN AREA

	TOTAL %	GEOGRAPHIC LOCATION	
		Large Urban %	Small Urban %
Almost impossible/very difficult	37.9	40.6 [a]	33.9
Somewhat difficult	50.2	48.3	53.0
Not difficult at all	11.9	11.1	13.1
BASE	(1371)	(824)	(548)

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[a] Large urban and small urban differ significantly

TABLE 1.9

PERCEIVED DIFFICULTY OF OBTAINING PART TIME JOB IN AREA

	TOTAL %
Almost impossible/very difficult	23.1
Somewhat difficult	47.9
Not difficult at all	29.0
BASE	(1371)

Differences between respondents living in large urban versus small urban areas are not statistically significant, and therefore, are not shown.

SECTION II

Propensity to Serve in the Reserve Components

2.1 Definition of Propensity

A principal measure in this study is enlistment propensity (i.e., the stated likelihood of serving in the Reserve Components). Respondents were asked to indicate their likelihood of serving in the Army National Guard, Air National Guard, Army Reserve, Air Force Reserve, Naval Reserve, Marine Corps Reserve and Coast Guard Reserve, as well as the active duty military. Respondents were asked to indicate how likely it was that they would serve in each of the specific services. The following scale was used:

Definitely, Probably → Positive Propensity Group

Probably not, Definitely not → Negative Propensity Group

Those who answered "definitely" or "probably" with respect to one or more of the seven Reserve Components have been classified as positive propensity. Others are classified as negative propensity.

Psychologists have found that the best predictor of an individual's future behavior is often a statement about what he expects to do in a situation. The measure of propensity is a measure of this type. No attitudinal statement should be interpreted as being a definitive predictor of human behavior, however, since there are many factors that can intervene between an expression of an attitude and the actual behavior. Nevertheless, propensity is the best measure of this type available to us. While its specific relationship to enlistment is not certain, it appears to be highly correlated with future enlistment. Propensity data obtained in the present

study were compared to known accessions for specific age and racial groups and found to correlate by a factor of .77.* A perfect correlation is 1.0.

The purpose of this section is to provide an analysis of propensity. First the measurement itself is examined. Then those factors are identified which may discriminate between positive and negative propensity groups.

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*This relationship is based on three elements of data:

(1) 1970 Census figures for white and non-white males, ages 17 to 26;

(2) actual accessions for these demographic groups for the period December 1976 through June 1977, provided by MARDAC; and (3) propensity data collected in the present study.

2.2 Probability of Serving in the Reserve Components

Propensity consists of young men's ratings of their probability of entering any of the seven Reserve Components. Table 2.1 presents three positive propensity measures:

- The proportion of young men who express a positive likelihood of serving in any one or more of the seven Reserve Components.
- The proportion of young men who express a positive likelihood of serving in one or more of the five branches of the Reserves.
- The proportion of young men who express a positive likelihood of serving in one or both of the two branches of the National Guard.

Table 2.1 can be summarized as follows:

1. Approximately one-in-six (17.9%) respondents said that they "definitely" or "probably would" serve in any one or more of the Reserve Components.
2. Approximately one-in-seven (14.5%) young men rated themselves as possible entrants into the Army Reserve, Air Force Reserve, Naval Reserve, Marine Corps Reserve and/or Coast Guard Reserve.
3. One-in-twelve (8.2%) respondents expressed positive propensity to serve in the Army National Guard and/or Air National Guard.

Table 2.2 shows the proportion of respondents who indicated positive propensity for each of the Reserve Components. The overall rank order of the Reserve Component services based on expressed propensity levels also is shown in Table 2.2 In terms of propensity to serve, no one service is dominant.

TABLE 2.1

POSITIVE PROPENSITY
TO SERVE IN
RESERVE COMPONENTS

	TOTAL %
Reserve Components (net)	17.9
Reserves (only)	14.5
National Guard (only)	8.2
BASE	(1371)

TABLE 2.2

POSITIVE PROPENSITY
TO SERVE IN
SPECIFIC RESERVE COMPONENTS

	TOTAL %
Army National Guard	5.5
Air Force Reserve	5.5
Army Reserve	5.3
Naval Reserve	4.8
Coast Guard Reserve	4.6
Air National Guard	4.4
Marine Corps Reserve	3.3
BASE	(1371)

2.3 Enlistment Decision Process

The enlistment decision process may be a multi-step process. The individual may first decide to serve in the military and then choose among the different services.

As Table 2.3 shows, a large number of men who have positive propensity for each of the Reserve Components are also positive towards one or more other services. On the average, positive propensity young men showed a positive disposition toward two to three services.

The six Reserve Components appear to draw upon the same or similar pool of young men. This seems to be especially true with respect to certain combinations of services. For instance, over one-half of the young men with positive propensity for the Army National Guard also have positive propensity for the Army Reserve. Just the opposite is true for those with positive propensity for the Army Reserve. A similar relationship exists between the Air Force Reserve and Air National Guard. These inter-relationships seem reasonable in view of the missions of the respective services. The Marine Corps Reserve has inter-relationships with both the Army Reserve and Naval Reserve. These also seem reasonable because of similarities in missions with both the Army and the Navy.

The enlistment decision process also may involve the choice between active duty and reserve duty. As Table 2.4 shows, approximately one-half of the young men who expressed positive propensity for the Reserve Components also rated themselves as being likely to serve in the active duty military.

TABLE 2.3

THE EXTENT TO WHICH PROSPECTS SHOW POSITIVE PROPENSITY FOR MORE THAN ONE RESERVE COMPONENT

Also Show Positive Propensity For These Components	Individuals with positive propensity for these components: Army National Guard %	Air Force Reserve %	Army Reserve %	Naval Reserve %	Air National Guard %	Marine Corps Reserve %
Army National Guard	100.0	30.9	(55.2)	33.8	37.7	36.5
Air Force Reserve	31.6	100.0	31.5	36.6	(51.2)	33.8
Army Reserve	(53.8)	30.0	100.0	38.0	30.6	(41.8)
Naval Reserve	29.6	31.3	34.0	100.0	32.7	(44.7)
Air National Guard	30.5*	(40.4)	25.4	30.2	100.0	23.3
Marine Corps Reserve	21.7	19.7	25.5	30.3	17.1	100.0
Average Number of Services	2.67	2.52	2.72	2.69	2.69	2.80
BASE	(74)	(76)	(73)	(65)	(60)	(44)

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*Example: This says that 30.5% of the respondents who have positive propensity for the Army National Guard also have positive propensity for the Air National Guard.

Circled entries indicate relatively high overlap.

TABLE 2.4

THE EXTENT TO WHICH RESERVE COMPONENT PROSPECTS SHOW POSITIVE PROPENSITY FOR ACTIVE DUTY SERVICE

	Individuals with positive propensity for these components:	
	National Guard	Reserves
	%	%
Also show positive propensity for active duty service	51.0	48.1
BASE	(112)	(199)

Data for the individual components are not shown since there are no statistically significant differences among the six Reserve Components on this measure.

2.4 Officer Versuu Enlisted Entry Expectations

Respondents who expressed positive propensity for serving in the Reserve Components were asked their expectations with respect to entering the service as enlisted men or as officers. Table 2.5 shows that two-thirds (68.5%) of these individuals expect to enter the service as enlisted men. This is virtually identical to the 68.9% figure reported in the Youth Attitude Tracking Study (Spring, 1977) as the proportion of young men who expect to enter active duty service as enlisted men.

TABLE 2.5

EXPECTATION OF ENTERING RESERVE COMPONENTS AS AN ENLISTED MAN OR OFFICER

	TOTAL %
Enlisted man	68.5
Officer	31.5
BASE	(245)

2.5 Demographic Profiles

Demographic composites for the positive and negative propensity groups for the National Guard and those for the Reserves are presented in Tables 2.6 and 2.7, respectively. Statistically significant (as assessed by *t*-test) differences between the groups are footnoted.

The positive and negative propensity groups for the National Guard differ as follows:

1. Blacks comprise nearly four times the proportion of the positive propensity group as of the negative propensity group.

2. A lower proportion of positive propensity individuals are employed in white collar occupations. At the same time, a considerably larger proportion of positive propensity individuals are not presently employed.

3. While the two groups do not differ with respect to the proportion of students, they do differ with respect to level of schooling. High school students make up a higher proportion of the positive group than of the negative group. At the same time, positive propensity individuals are less likely to have had a college preparatory curriculum in high school.

4. The positive propensity individual is less likely than his negative propensity counterpart to be from a large urban area.

5. The two groups, however, do not differ with respect to average weekly earnings. This is important in view of the fact that economic incentives are likely to have the greatest impact on enhancing accessions (see Section IV).

TABLE 2.6

ANALYSIS OF PROPENSITY TO SERVE
IN THE NATIONAL GUARD
GROUP PROFILES ON DEMOGRAPHIC VARIABLES

	Positive Propensity	Negative Propensity
Average age	19.7 years	20.6 years
Blacks	36.3% [a]	9.6%
Other non-white	1.9%	2.3%
White collar	11.6% [a]	19.9%
Blue collar	32.2% [a]	41.4%
Not working	57.2% [a]	38.7%
Average earnings	$143.00	$139.00
High demand on time	13.0%	16.2%
Students	54.9% [a]	53.2%
In high school	20.5%	11.5%
In vocational/trade school	2.7%	5.6%
In college	29.5%	35.6%
High school graduate not in school	25.0%	30.0%
College preparatory curriculum in high school	34.6% [a]	59.5%
Vocational curriculum in high school	32.4%	27.2%
Married	4.7%	8.6%
Resident of large urban area	43.8% [a]	61.5%
BASE	(112)	(1260)

[a] Positive and negative propensity groups differ significantly

The positive and negative propensity groups for the Reserves differ in these ways:

1. Blacks comprise three times the proportion of the positive group as of the negative group.

2. Compared to his negative propensity counterpart, the positive propensity individual is less likely to be employed in a white collar occupation, and considerably more likely to be unemployed.

3. Although they do not differ with respect to overall proportion of students, they differ in terms of level. As in the case of the National Guard, this explains why they do not differ significantly with respect to students in general. Positive propensity individuals are more likely to be in high school, and, correspondingly, less likely to be in college. Positive propensity individuals, also are less likely to have had a college preparatory curriculum in high school. Rather, they are more likely to have had a vocational curriculum. This is a significant difference not observed with respect to the National Guard.

4. As in the case of the National Guard, the two groups do not differ with respect to average weekly earnings.

TABLE 2.7

ANALYSIS OF PROPENSITY TO SERVE IN THE RESERVES GROUP PROFILES ON DEMOGRAPHIC VARIABLES

	Positive Propensity	Negative Propensity
Average age	19.0 years	20.9 years
Blacks	27.7% [a]	9.1%
Other non-white	2.7%	2.1%
White collar	7.0% [a]	21.4%
Blue collar	42.7%	40.3%
Not working	50.3% [a]	38.3%
Average earnings	$128.00	$140.00
High demand on time	14.1%	16.3%
Students	59.9% [a]	52.3%
In high school	27.7%	9.7%
In vocational school	9.1%	4.8%
In college	22.1% [a]	37.1%
High school graduate not in school	24.1%	30.5%
College preparatory curriculum in high school	34.9% [a]	61.3%
Vocational curriculum in high school	40.0% [a]	25.6%
Married	8.3%	8.3%
Resident of large urban area	53.3%	61.3%
BASE	(199)	(1172)

[a] Positve and negative propensity groups differ significantly

SECTION III

Perceptions of Twelve Reserve Component Attributes

The ultimate success of the Reserve Components in attracting new personnel is contingent, in part, on what individuals perceive to be current levels of various characteristics of the "product" offered by the Reserve Components as well as the value or importance these people attach to those characteristics. The issues of values attached to product characteristics is discussed in Section IV. In this section, perceptions are examined.

The perceptual data have important implications for recruiting strategies. If recruiting strategies can be conceptualized as having two primary functions -- product delivery and product communication -- then the question can be posed as to which function should be emphasized. The perceptual data gathered in this study offer guidance. Favorable misperceptions would suggest that there is less need to emphasize product communications, but a need to improve the product. On the other hand, misperceptions in an unfavorable direction would suggest that there is an opportunity for improved product communications. For example, individuals may believe that the Reserve Components currently offer educational assistance benefits when in fact none are offered. This is a misperception in a favorable direction. The implication for recruiting strategies would be that emphasis should be placed on the more difficult task of modifying the product rather than on product communication. It should be kept in mind that we are talking about "degree of emphasis" not doing one activity in lieu of the other. This is the framework in which the perceptual data are analyzed.

3.1 Procedures for Collecting Perceptual Data

Respondents were shown 12 attributes that described various Reserve Component characteristics, benefits and incentives. These attributes and their levels were discussed in the Introduction of this report. For each attribute, respondents were asked to indicate from a list of two to four levels what they believed to be the current level. This series of questions was asked just prior to the trade-off portion of the interview where respondents indicated their preference for various combinations of these attributes.

3.2 Current Perceptions of the Reserve Components

Table 3.1 summarizes the perceptions of the total sample of NPS respondents. To facilitate the interpretation of this table, the correct level of each attribute and corresponding percentage have been boxed.

In general, respondents indicated a high level of incorrect perceptions with respect to the Reserve Components. These misperceptions, moreover, are in a direction which suggests that product modification rather than just more effective communications will be required.

The following conclusions can be drawn from Table 3.1:

1. Overall, retirement benefits has the highest level of correct perception, followed by tax on military pay and when unit meetings are held.

2. Educational assistance benefits has the lowest level of correct perception. Only one-in-nine respondents realized that the Reserve Components do not offer any educational assistance at present. Starting pay and what is done at unit meetings followed in terms of rank-ordered level of misperception.

3. For the most part, the level of misperception associated with the 12 attributes is comparable across positive and negative propensity groups for both the National Guard and Reserves. For this reason the perception data for these subgroups are not summarized in a table in this report. These data are presented, however, in the tabulations that accompany this report. With respect to these data, some differences among the propensity groups do appear. The two National Guard propensity groups differ on three attributes. The positive propensity group is less likely than the negative group to correctly perceive these attributes: enlistment bonus, tax on pay, and when unit meetings are held. With respect to the two Reserve propensity groups, the positive propensity group is less likely than the negative group to correctly perceive these four attributes: enlistment bonus, educational assistance, tax on pay, and hair regulations.

4. Relative to each other, the positive propensity groups for both the National Guard and Reserves exhibit no differences with respect to their perceptions of the Reserve Components.

5. The fact that the majority of respondents perceive each of these attributes to be characterized by higher than actual levels suggests that the Reserve Components need to concentrate their recruiting strategy development efforts primarily on product improvement rather than communications.

TABLE 3.1

PERCEPTIONS OF RESERVE COMPONENTS
ON TWELVE ATTRIBUTES

Said This Attribute Level Best Describes The Reserve Component	TOTAL %
Retirement:	
Retirement after 20 years of service and receive about $235/month plus benefits at age 60	**58.8**
Retire after 30 years of service and receive about $235/month plus benefits at age 50	33.0
Receive no retirement pay or benefits	8.2
Tax on pay:	
Military pay is tax free	44.8
Military pay is not tax free	**55.2**
When unit meetings are held:	
1 session/month taking 2 days in one weekend	**46.3**
2 sessions/month taking 2 different Saturdays	35.6
3 sessions/month taking 1 Saturday and 2 weekend evenings	18.1
Hair regulations:	
No regulations on hair length	17.0
Your hair must look short for meetings; short haired wigs o.k.	**40.3**
Your hair must be short. No wigs permitted	42.7

Boxed entries indicate current level of each attribute.

Data are shown for the total NPS sample only, since there are few statistically significant differences among propensity groups for either the National Guard or Reserves.

TABLE 3.1 (cont'd)

Said This Attribute Level Best Describes The Reserve Components	TOTAL %
Enlistment Bonus:	
$3,000	8.7
$1,000	23.0
$ 300	29.7
None	**38.6**
Length of Enlistment:	
4 years	66.0
6 years	**30.7**
8 years	3.3
PX/BX/Commissary privileges:	
Available all the time for self and family	52.6
Available when on duty for self and family	**30.2**
Available when on duty for self only	17.2
Hours of meetings each month:	
12	40.1
16	**28.1**
20	9.3
24	22.5

Boxed entries indicate current level of each attribute.

Data are shown for the total NPS sample only, since there are few statistically significant differences among propensity groups for either the National Guard or Reserves.

TABLE 3.1 (cont'd)

Said This Attribute Level Best Describes The Reserve Components	TOTAL %
Annual training:	
During vacation you get military plus civilian pay	29.3
Not during vacation; you get military plus civilian pay	27.7
Not during vacation. Employer makes up pay difference	16.5
Not during vacation. You get only military pay	26.5
Starting Pay:	
$1,293 per year ($4.24/hour)	26.5
$1,043 per year ($3.40/hour)	46.3
$ 862 per year ($2.84/hour)	19.5
$ 690 per year ($2.28/hour)	7.7
What is done at unit meetings:	
50% military training; 50% community service	44.1
75% military training; 25% community service	37.3
100% military training	18.6
Educational Assistance:	
100% coverage of educational costs up to $1,000 per year for 4 years	47.6
100% coverage of educational costs up to $500 per year for 4 years	20.6
50% coverage of educational costs up to $500 per year for 4 years	20.4
None	11.4

Box entries indicate current level of each attribute.

Data are shown for the total NPS sample only, since there are few statistically significant differences among propensity groups for either the National Guard or Reserves.

SECTION IV

Trade-off Analysis of Reserve Component Attributes

In this section a mathematical and psychological model of Reserve Components accessions is discussed. This model is based on trade-off methodology which is discussed in detail in **Appendix IV of this report.**

4.1 Some Background On Trade-off Analysis

By knowing the importance (utility) respondents attach to each of the 12 attributes and their stated likelihood of joining the Reserve Components, it is possible to estimate the number of accessions that are likely to result from modifying the Reserve Components in terms of the 12 characteristics. This analysis is done on a person-by-person basis. Each individual's value for each level of each attribute and his reported likelihood of joining the Reserve Components (i.e., determined by his responses to a series of hypothetical profiles) is reflected in this analysis. The basic result in this analysis is "number of estimated accessions."

The procedure for collecting trade-off data was as follows. Respondents were presented with a series of pairwise comparisons of attributes. A typical pairwise question was presented in a format like the following.

Which would you prefer . . .

A 4 year enlistment term and a $1,000 bonus	OR	A 6 year enlistment term and a $3,000 bonus

By observing preferences for various combinations of attributes and attribute levels in this manner, we were able to determine the degree of importance each respondent attached to each level of each attribute.

Having thus determined his attribute preferences, measures of reported likelihood (propensity) of enlisting were obtained as follows. The respondent was shown a series of hypothetical profiles of the Reserve Components and asked how likely he would be to enlist if the Reserve Components were as

described in the profiles. Specifically, the profiles described hypothetical modifications of the National Guard and Reserves in terms of the 12 attributes. For eight of the attributes current levels were shown. For the other four attributes, various modified levels were shown. The combination of attributes shown at their actual levels and those shown at modified levels was varied across the sample of respondents. This enabled us to present each respondent with profiles of the Reserve Components that varied in their degree of attractiveness. Each respondent then was asked to rate his likelihood of joining the Reserve Components under several of these sets of conditions.

Trade-Off Analysis uses a series of computer simulations. Each simulation can be conceptualized as involving the Reserve Components described in terms of the actual levels of each of the 12 attributes ("Current Product") or the Reserve Components described in terms of the actual levels of some of the attributes and modified levels of other attributes ("Modified Product"). The first simulation is referred to as the "base case". This simulation provides a baseline of the estimated number of accessions that are likely to result from the "Current Product". This estimate is based on mathematically combining each respondent's value for the actual level of each attribute and his stated likelihood of enlisting with that of all other respondents. A more detailed explanation of this procedure is offered in Appendix IV.

The succeeding simulations take one product and modify it in terms of one attribute, holding all others at their actual levels. These simulations derive the estimated number of accessions that are likely to result from each attribute if it were modified to more attractive levels. Dividing the number of estimated accessions resulting from the "Modified Product" by the number of estimated accession resulting from the "Current Product" results in the percent change in estimated accessions. This percentage can be used to indicate the "power" of the attribute relative to other attributes.

The data from the base case have been calibrated so that the accessions shown are equal to total accessions during the seven month period from December 1976 through June 1977.

The number of estimated accessions that is derived from this procedure should be interpreted only as being an indication of the number of accessions that would be likely to occur in a corresponding period if all respondents behaved according to their stated likelihood of enlisting. As such, the accession numbers should not be interpreted as absolute projections of enlistments. The model does provide, however, a sound indication of the relative power of each attribute in terms of its impact on accessions.

The actual level of estimated expected accessions depends importantly on the likelihoods that respondents give for joining the Reserve Components. In the introduction to this report we discussed the fact that no measure of any kind can be a completely accurate predictor of actual behavior. Hence, we cannot be as certain about the absolute levels of accessions as we are about relative levels.

4.2 Sensitivity Analysis of Attributes

With the above as background, the first step in Trade-Off Analysis is to determine the relative importance of each attribute. This is accomplished by determining the change in estimated number of accessions that results from modifying the actual level of the attribute to a more favorable level, holding all other attributes constant.

Table 4.1 shows results of a sensitivity analysis of the attributes. The attributes are listed in descending order of their relative importance. Two attributes--when unit meetings are held and retirement--are currently at their most favorable levels. Hence, they offer no recruiting strategy opportunities and, therefore, are shown at the end of the table. The numbers in the right-hand columns represent estimated number of seven-month accessions and percent changes in estimated number of accessions from the base (current) case. Because these estimates are based on measures of stated likelihood of enlisting and actual seven-month accessions data, these numbers have been labeled as being indices of potential for increase in accessions, obtainable only if potential recruits acted according to their stated likelihood of joining the Reserve Components.

The following conclusions can be drawn from Table 4.1:

1. Large economic benefits appear to offer the greatest attraction for joining the Reserve Components. On an individual basic, educational assistance amounting to 100% coverage; $1,000 for each of 4 years and a $3,000 enlistment bonus are likely to have the largest impact on accessions.

2. Starting pay of $4.24 per hour (a 50% increase over the current level) is likely to significantly enhance accessions. Its power as an attribute, however, is considerably less than educational assistance.

3. Other financial or quasi-financial attributes are among the less powerful or important attributes. PX/BX/Commissary privileges, military pay being tax free, and annual training vacation arrangements could all affect the real income of reservists, at least to some degree, but their impact on accessions is relatively small.

4. Factors related to the impact of Reserve Component membership on lifestyle (i.e., frequency of meetings, length of meetings per month, hair regulations) also have relatively little impact on accessions.

TABLE 4.1

SENSITIVITY ANALYSIS

Attribute	Level	Potential For Increase in Accessions: 7 - Month Estimated #	% Change
Current Product	Actual levels of the 12 attributes	27,000	-
1. Educational Assistance	100% coverage: $1,000 for each of 4 years	48,000	+78
	100% coverage; $500 for each of 4 years	41,000	+52
	50% coverage; $500 for each of 4 years	36,000	+33
2. Enlistment Bonus	$3,000	43,000	+59
	$1,000	37,000	+37
	$300	31,000	+15
3. Starting Pay	$4.24 per hour	41,000	+52
	$3.40 per hour	34,000	+26
	$2.28 per hour*	23,000	-15
4. Initial Term of Service	4 years	35,000	+30
	8 years*	20,000	-26
5. Federal Income Tax Deduction	Military pay is tax free	35,000	+30
6. Annual Training	Summer camp taken during vacation. Receive military and civilian pay	33,000	+22
	Summer camp taken not during vacation. Receive military and civilian pay	31,000	+15
	Summer camp taken not during vacation. Receive only civilian pay	28,000	+ 4

* Lower than current level

TABLE 4.1 (cont'd)

Attribute	Level	Potential For Increase in Accessions 7-Month Estimated #	% Change
7. PX/BX Commissary Privileges	Available all of the time for entire family	32,000	+18
8. What is Done at Unit Meetings	50% military training/ 50% community service	31,000	+15
	75% military training/ 25% community service	30,000	+11
9. Hair Regulations	None	29,000	+ 7
	Must be short *	24,000	-11
10. Hours of Meetings Each Month	12 hours	28,000	+ 4
11. When Unit Meetings are held	2 sessions/ month taking 2 different Saturdays *	26,000	- 4
	3 sessions/ month taking 1 Saturday and 2 weekday evenings*	25,000	- 8
12. Retirement	Retire after 30 years of service and receive about $235/ month plus benefits at age 50 *	26,000	- 4
	Receive no retirement pay or benefits *	18,000	-33

* Lower than current level

As shown in Table 4.1, four attributes--educational assistance, enlistment bonus, starting pay, and initial term of service--appear to have the largest impact on accessions. Modifying one or more of these four attributes is likely to be the most effective course of action. Hence, the remainder of this section focuses on these four attributes.

Table 4.2 shows the estimated impact of these attributes on accessions of certain key demographic groups.

The following conclusions can be drawn:

1. Within each demographic group, the relative impact on accessions of each level of each attribute tends to parallel the corresponding impact on the total NPS sample.

2. Within each attribute, there appears to be little discrimination among demographic groups in terms of absolute impact on accessions. There are two exceptions. Enlistment bonuses of $1,000 and $3,000 appear to have an appreciably larger impact on the accessions of individuals whose highest education is high school.

TABLE 4.2

POTENTIAL FOR INCREASE IN ACCESSIONS: SELECTED ATTRIBUTES BY KEY DEMOGRAPHIC GROUPS

		Attribute*								
		Educational Assistance			Enlistment Bonus			Starting Pay		Term
	Current** Product	100% ($1,000)	100% ($590)	50% ($500)	$3,000	$1,000	$ 00	$4.24/ hour	$3.40/ hour	4 years
TOTAL SAMPLE	27,00	+78%	+52%	+33%	+59%	+37%	+15%	+52%	+26%	+30%
Race										
White	19,000	+81%	+56%	+35%	+61%	+37%	+15%	+53%	+26%	+34%
Non-White	8,000	+76%	+54%	+36%	+65%	+45%	+21%	+54%	+27%	+27%
Highest Education										
Beyond High School	17,000	+81%	+57%	+36%	+60%	+37%	+15%	+54%	+26%	+32%
High School Grad.	4,000	+81%	+57%	+37%	+74%	+52%	+24%	+56%	+28%	+31%
High School Dropout	6,000	+74%	+52%	+33%	+59%	+37%	+18%	+50%	+24%	+32%
Occupation										
White Collar	4,000	+80%	+54%	+33%	+62%	+37%	+15%	+53%	+25%	+30%
Blue Collar	11,000	+79%	+56%	+35%	+60%	+38%	+16%	+55%	+27%	+34%
Non-Working	3,000	+83%	+57%	+38%	+62%	+40%	+17%	+53%	+26%	+31%
Student	9,000	+76%	+55%	+35%	+60%	+43%	+19%	+52%	+25%	+31%
Location										
Large Urban	16,000	78%	55%	34%	58%	36%	16%	50%	24%	31%
Small Urban	11,000	81%	57%	37%	67%	44%	19%	58%	29%	33%

* Data are shown as percent increases in accessions over current (base) product.

** Data are shown as estimated accessions.

Boxed entries indicate percent increases in accessions that are 10 or more percentage points higher than other percent increases shown for the particular level of the attribute.

4.3 Resultant Impact of Combining Attributes

In an attempt to increase accessions, it is possible that the Reserve Components will modify more than one attribute. When more than one attribute is modified the resulting estimate of accessions is not the arithmetic sum of the individual attributes. Trade-Off Analysis enables us to determine the impact of any combination of attributes on accessions.

The sensitivity analysis suggested that some attribute combination of educational assistance, enlistment bonus, starting pay, and initial term of service will have the largest impact on accessions. There are many combinations of these four attributes that could be created. For purposes of this report, however, we have created 12 hypothetical products. The 12 hypothetical products were created using the following framework:

> What is the fewest number and perhaps the least potentially expensive combination of attributes that will achieve approximately the same results as the single most powerful benefit (educational assistance amounting to 100% coverage; $1,000 for each of four years... + 78% increase in accessions)

Eight of the hypothetical products represent modifications of two attributes. The other four hypothetical products are based on modifying three of the four attributes in question. For the most part, these configurations of job characteristics, benefits, and incentives represent combinations of attributes at levels lower than their most favorable.

The Department of Defense has been provided with tapes of the data that will enable them to simulate any additional combination of attributes, using any other rationale than the one used here.

Table 4.3 lists the 12 hypothetical products and shows their estimated impact on accessions of key demographic groups.

The following conclusions can be drawn from Table 4.3.

1. Of the 12 hypothetical products, Product # 11 -- the combination of educational assistance amounting to 50% coverage; $500 for each of 4 years plus starting pay of $3.40 per hour (a 20% increase over the current level) plus an enlistment term of 4 years -- and Product #1 -- educational assistance amounting to 100% coverage; $500 for each of 4 years plus a $1,000 enlistment bonus -- are likely to have the largest impact on accessions in total as well as for each demographic group.

2. Results comparable to Product # 11 are likely to be achieved by either Product #6 or Product #4. Product #6 offers the same educational assistance as Product # 11, but also offers starting pay of $4.24 per hour (a 50% increase over the current level) and keeps enlistment term at its current 6-year level. Product #4 shows that comparable results might be achieved by enchancing educational assistance one additional level (i.e., 100% coverage; $500 for each of four years) in combination with an enlistment term of four years, while holding pay at its current level.

3. Should the Reserve Components decide to not offer educational assistance, Produce #8 -- starting pay of $4.24 per hour plus an enlistment term of four years -- is likely to be the next most effective product in terms of enhancing accessions.

4. All five products (#1, #4, #6, #8, # 11) are likely to produce results greater than any single attribute modification.

5. Highest education attained appears to be the one demographic variable for which these products discriminate the most. Products #5, #7, #9 and #12 appear to be most attractive to those whose highest level of education is high school.

Once again, these estimated accessions should be interpreted as only being an indication of the number of accessions that are likely to occur, in a comparable seven month period, if all respondents behaved according to their stated likelihoods of enlisting.

TABLE 4.3

POTENTIAL FOR INCREASE IN ACCESSIONS AS A RESULT OF COMBINING SELECTED ATTRIBUTES BY KEY DEMOGRAPHIC GROUPS

Attribute:	Modified Product*					
	(1)	(2)	(3)	(4)	(5)	(6)
Education:	100%($500)	100%($500)	100%($500)	100%($500)	50%($500)	50%($500)
Bonus:	$1,000	$500	---	---	$1,000	---
Pay:	---	---	$3.40/hr.	---	---	$4.24/hr.
Term:	---	---	---	4 years	---	---
TOTAL SAMPLE	+88%	+71%	+80%	+84%	+72%	+84%
Race						
White	+88%	+71%	+80%	**+87%**	+71%	+84%
Non-white	+89%	+72%	+78%	+77%	+75%	+84%
Highest Education						
Beyond High School	+88%	+71%	+81%	+85%	**+71%**	+85%
High School Grad	+97%	+7.%	+83%	+86%	**+84%**	+88%
High School Dropout	+83%	+67%	+73%	+81%	+67%	+78%
Occupation						
White Collar	+88%	+69%	+86%	+85%	+70%	+85%
Blue Collar	+87%	+70%	+86%	+85%	+70%	+84%
Non-Working	+90%	+72%	+82%	+85%	+74%	+87%
Students	+90%	+72%	+78%	+83%	+75%	+82%
Location						
Large Urban	+85%	+69%	+77%	+83%	+68%	+80%
Small Urban	+93%	+74%	+84%	+86%	**+76%**	+89%

*Data are shown as percent increases in accession over current (base) product.

Boxed entries indicate percent increases in accessions that are 10 or more percentage points higher than other percent increases shown for the particular level of the attribute.

TABLE 4.3 (cont'd)

Attribute:		Modified Product* (7)	(8)	(9)	(10)	(11)	(12)
	Education:	---	---	50%($500)	50%($500)	50%($500)	---
	Bonus:	$1,000	---	$300	$300	---	$300
	Pay:	---	$4.24/hr.	$3.40/hr.	---	$3.40/hr	$3.40/hr.
	Term:	4 years	4 years	---	4 years	4 years	4 years
TOTAL SAMPLE		+71%	+82%	+76%	+81%	+89%	+74%
Race							
White		+71%	+83%	+75%	+83%	+91%	+76%
Non-white		+69%	+78%	+78%	+78%	+83%	+72%
Highest Education							
Beyond High School		+69%	+82%	+76%	+81%	+89%	+73%
High School Grad		+81%	+85%	+86%	+89%	+92%	+83%
High School Dropout		+68%	+79%	+71%	+78%	+84%	+72%
Occupation							
White Collar		+68%	+83%	+75%	+79%	+90%	+73%
Blue Collar		+70%	+82%	+75%	+81%	+89%	+74%
Non-Working		+70%	+82%	+79%	+84%	+92%	+74%
Students		+73%	+81%	+77%	+82%	+87%	+75%
Location							
Large Urban		+67%	+79%	+72%	+79%	+86%	+71%
Small Urban		+75%	+86%	+82%	+85%	+93%	+79%

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* Data are shown as percent increases in accessions over current (base) product.

Boxed entries indicate percent increases in accessions that are 10 or more percentage points higher than other percent increases in for the particular level of the attribute.

CURRENT GUARDSMEN AND RESERVISTS

SECTION V

Characteristics of Reserve Component Service

This section serves as an introduction to the study of the re-enlistment intentions of current guardsmen and reservists.

The Department of Defense in conjunction with the individual services provided the names of over 1,000 guardsmen and reservists living in the nine markets in which this study was conducted. These names were randomly selected and represented men in grades E-4 to E-7 who were in their initial six-year commitment. From this list of nar as, 217 interviews were completed.

Key characteristics of the sample are presented in the following pages. Table 5.1 shows the proportion of men in each of the six components. Table 5.2 shows the proportion of men in each grade level. Table 5.3 summarises the jobs performed in the Reserve Components by these men. Each respondent was asked what he did in the Reserve Components. This information then was grouped into five classifications: administrator, electronics, mechanics, general combat and general non-combat (i.e., everything in addition to the above four groups).

TABLE 5.1

RESERVE COMPONENT
IN WHICH SERVING

	TOTAL %
Army Reserve	45.6
Army National Guard	34.6
Air National Guard	7.8
Marine Corps Reserve	5.5
Naval Reserve	4.2
Air Force Reserve	2.3
BASE	(217)

TABLE 5.2

GRADE IN RESERVE COMPONENTS

	TOTAL %
E-4	45.1
E-5	40.9
E-6	13.5
E-7	.5
BASE	(217)

TABLE 5.3

JOB IN RESERVE COMPONENTS

	TOTAL %
General non-combat	36.8
Administrator	21.7
General combat	18.0
Electronics	9.7
Mechanic	7.8
Did not provide information	6.0
BASE	(217)

SECTION VI

Analysis of Demand on Time: Employment and Educational Involvement

In deciding whether or not to re-enlist in the Reserve Components an individual presumably considers a number of factors. One of these factors is the extent of time he has available to participate in the National Guard or Reserves. As he nears the end of his initial six-year commitment, the guardsman or reservist may no longer have as much free time as he did when he first entered the service. As he gets older, his vocation and his family may demand more of his time. Hence, an analysis of the major activities (i.e., employment and educational involvement) that place demands on the guardsman's or reservist's time is necessary to understanding his re-enlistment intentions.

6.1 Level of Employment

Table 6.1 summarizes the level of employment of the 217 guardsmen and reservists who participated in this study. As the table shows, virtually all of them reported being employed in full time occupations. For one-in-ten men, their service in the Reserve Components was their only employment.

Table 6.2 shows that over one-half of guardsmen and reservists who reported being employed hold white collar positions, especially professional or technical jobs. Enlistment intentions of NPS civilians suggest that the proportion of white collar and blue collar personnel may be expected to reverse, in the near future, in the direction of more blue collar individuals. The extent to which white collar/blue collar occupation is a discriminating factor with respect to re-enlistment intentions is addressed in Section VII.

TABLE 6.1

REPORTED LEVEL OF EMPLOYMENT

	TOTAL %
Employed	**89.4**
Full-time	75.1
Part-time	3.2
Both full-time and part-time	11.1
Not employed	**10.6**
BASE	(217)

TABLE 6.2

OCCUPATION

	TOTAL %
White Collar	57.2
Professional/technical	30.9
Manager/proprietor	12.4
Sales	6.7
Clerical	7.2
Blue Collar	42.8
Craftsman/skilled labor	14.4
Machinery operator	5.2
Service worker	11.3
General laborer	11.9
BASE	(194)

6.2 Employment and Educational Involvement

Table 6.3 summarizes the degree to which guardsmen and reservists are both employed and going to school. As the table shows, 28.2% of these men reported that they are both working and attending school. Only 4.2% said that they were neither employed nor going to school.

TABLE 6.3

LEVEL OF EMPLOYMENT COMBINED WITH EDUCATIONAL INVOLVEMENT

	TOTAL %
Employed and attend school	28.2
Employed only	61.1
Not employed and attend school	6.5
Not employed and do not attend school	4.2
BASE	(217)

6.3 Derived Demand on Time

As was done for the sample of NPS civilian males, an index of demand on time was created by asking each respondent a series of employment and education questions. The derivation of the demand on time index was explained in Section I, Table 1.4

Table 6.4 shows that 70.5% of the respondents indicated that they have a relatively high demand placed on their time during an average week. This compares to a figure of 15.8% for the NPS civilian sample. The difference is explained by the fact that all military respondents, unlike NPS civilians, have at least one job -- the National Guard/Reserves. Like their NPS civilian counterparts, individuals with a high demand on their time are typically people who hold more than one non-military job or are working full time plus going to school. As such they are working and perhaps going to school more than 40 hours a week.

TABLE 6.4

DEMAND ON TIME

	TOTAL %
High	70.5
Medium	19.8
Low	9.7
BASE	(217)

6.4 Characteristics of Employment

Table 6.5 profiles several key employment characteristics: number of jobs held, hours worked in an average week and average weekly compensation from all jobs.

As the table shows, 10.1% of the guardsmen and reservists interviewed said that they are working more than one job in addition to their military duty. The average number of hours worked each week was 45.7 hours and average total weekly income was $256 ($5.60 per hour on the average).

Respondents who reported having at least one job in addition to their military duty were asked why they work at more than one job. Since 65% of the sample are men who hold one job plus their military duty, the answers given to this question can be inferred as being addressed to their participation in the Reserve Components. As such, the information given here provides some insight into motivations for belonging to the National Guard and Reserves.

As shown in Table 6.6, the major reasons given were economic. For as many as 28.2% of the respondents, multiple employment provides supplemental income with which to meet regular household expenses. Others will use the income at some future date in time. Like their NPS civilian counterparts, few guardsmen and reservists cite social (e.g., association with others) or psychological (e.g., keep busy) motivation.

TABLE 6.5

KEY CHARACTERISTICS OF EMPLOYMENT

	TOTAL
Average number of hours worked per week on all jobs	45.7 hours
Percent who work more than 50 hours per week	30.4%
Average income per week from all jobs	$256.00
Percent who earn $100 or more per week	33.5%
Percent holding more than one non-military job	10.1
BASE	(217)

TABLE 6.6

MAJOR REASONS FOR HOLDING
MORE THAN ONE JOB**

	TOTAL % *
Meet regular household expenses	28.2
Save for the future	27.6
Earn extra money to buy something special	23.3
Pay off debts	16.0
Earn tuition for school	8.0
Keep busy	8.0
Be with other people	6.1
BASE	(163)

*Multiple mentions
**Includes individuals who hold one or more jobs in addition to their military duty

Like their NPS civilian counterparts, the majority of military respondents are neither working excessively long hours nor are they affluent. Accordingly, there appears to be considerable correspondence between the employment characteristics of these guardsmen and reservists and the time demand and benefits associated with participation in the Reserve Components.

6.5 Employment and Annual Training

As a part of his regular duty, a guardsman or reservist must serve on active duty for approximately two weeks each year. This time is usually spent on military training and is normally taken during the summer months. This two-week period of annual training can be a source of employment-related problems as well as personal frustration, should the timing interfere with job and personal commitments. As such, it could be a major barrier to re-enlistment. Of particular concern is whether guardsmen and reservists must take this time away from work as vacation and the compensation they receive during this period away from work. The correct procedure is that annual training is not to be counted as vacation time and the individual is to receive only his military pay.

As Table 6.7 shows, this was the situation for 40.1% of the men interviewed. Whether the individual receives both military and civilian pay or his employer makes up the difference between the two salaries is up to employers. For one-in-ten guardsmen and reservists interviewed, annual training was taken during vacation time.

TABLE 6.7

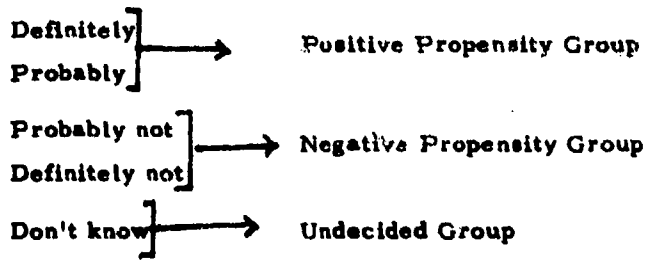
HOW EMPLOYER HANDLES
ANNUAL TRAINING

	TOTAL %
Annual training is taken not during vacation; receive only military pay	40.1
Annual training is taken not during vacation; employer pays difference between civilian and military pay	25.3
Annual training is taken not during vacation; receive both civilian and military pay	18.0
Annual training is taken during vacation; receive both civilian and military pay	10.1
Not employed	6.5
BASE	(217)

SECTION VII

Propensity to Re-Enlist in the Reserve Components

A critical measure in this study is the respondent's expressed intention of re-enlisting. A scale similar to that used to measure enlistment intentions of NPS civilians was used to determine relative likelihood of re-enlisting. Respondents were asked to indicate how likely it was that they would re-enlist. The following scale was used:



Those who answered "definitely" or "probably" to the question have been classified as positive propensity. Respondents who answered "probably not" or "definitely not" have been classified as negative propensity. A third group consists of those men who said that they did not know whether they would re-enlist.

This measure of propensity to re-enlist is used in a manner similar to the way the propensity to enlist measure obtained from NPS civilians is used. By knowing each respondent's propensity to re-enlist in the Reserve Components and his value for various Reserve Component characteristics, the impact of different configurations of job characteristics and benefit packages on re-enlistment intentions can be estimated.

This section presents an analysis of propensity. Both the measure itself and those factors that may discriminate among the three propensity groups are examined.

7.1 Probability of Re-enlisting in the Reserve Components

As Table 7.1 shows, 35.1% of the men interviewed expected to re-enlist. Another 15.2% were undecided. The National Guard and Reserves do not differ with respect to re-enlistment intentions.

7.2 Anticipated Length of Re-enlistment

Respondents who indicated they definitely or probably would re-enlist (i.e., positive propensity) were asked for how many years they expected to re-enlist. Table 7.2 shows that half of these men expected to re-enlist for only one year. The average was just over two years. Guardsmen and reservists did not differ with respect to length of expected re-enlistment.

TABLE 7.2

EXPECTED TERM OF RE-ENLISTMENT

	TOTAL %
One year	50.0
Two years	2.6
Three years	10.5
Four or more years	11.9
Don't know	25.0
Average	2.3
BASE	(76)

Data are shown for the total military sample only, since there are no statistically significant differences between guardsmen and reservists.

7.3 Demographic Profiles

Table 7.3 profiles the key characteristics of each of the three re-enlistment propensity groups. Dividing the sample of 217 respondents into three groups based on their expressed likelihood of re-enlisting results in relatively small sample sizes for each of the three groups. Hence, it is difficult to detect statistically significant differences among the groups. Some significant differences do appear. Some differences, while not statistically significant, should be noted also because the pattern of the data suggests that a particular demographic variable may have discriminated among propensity groups had the sample been larger. With this in mind, the following conclusions can be drawn from Table 7.3.

1. The proportion of Blacks in both the positive propensity group and undecided group is twice as great as it is for the negative propensity group.

2. Relative to the negative propensity group, both the positive propensity group and undecided group tend to be less educated.

3. Guardsmen and reservists in white collar occupations appear to be less likely than men in blue collar occupations to re-enlist.

   It should be noted that these are differences also reliably found between NPS men in terms of propensity of initial enlistment.

One additional conclusion can be drawn from Table 7.3.

4. While not statistically significant, the proportion of guardsmen and reservists in higher grades (E-6 and E-7) tends to be higher among the group intending to re-enlist. Success in the Reserve Components, as measured by grade achieved, thus may be an important factor related to re-enlistment intentions.

TABLE 7.3

ANALYSIS OF PROPENSITY TO RE-ENLIST
IN THE RESERVE COMPONENTS
GROUP PROFILES ON DEMOGRAPHIC VARIABLES

	Positive Propensity	Negative Propensity	Undecided
Average age	24.3 years	24.8 years	23.8 years
Blacks	25.0% [a]	12.0% [c]	27.3%
Other non-white	9.2%	8.4%	6.0%
White collar	47.4%	59.2% [c]	33.3%
Blue collar	44.7%	30.6%	48.5%
Not working	7.9%	10.2%	18.2%
Average earnings	$249	$267	$181
High demand on time	73.7%	71.3%	60.6%
Highest education: High school graduate	22.4%	13.9% [c]	33.3%
Highest education: College graduate	15.7% [a]	36.2% [c]	15.2%
Married	51.3%	56.5%	60.6%
Resident of large urban area	77.6%	75.9%	72.7%
Average number of years served in Reserve Components	4.3	4.6 [c]	3.6
E-4	39.5%	47.7%	50.0%
E-5	40.8%	41.1%	40.6%
E-6	18.4%	11.2%	9.4%
E-7	1.3%	-	-
General non-combat job	38.2%	36.1%	36.4%
Administrator job	22.4%	23.1%	15.2%
General combat job	17.1%	16.7%	24.2%
Electronics job	11.8%	9.3%	6.1%
Mechanic job	5.3%	8.3%	12.1%
Base	(76)	(108)	(33)

[a] Positive and negative propensity groups differ significantly

[c] Negative and undecided propensity groups differ significantly

7.4 Achievability of Life Goals and General Satisfaction With the Reserve Components

As one means of developing an understanding of the motivations underlying re-enlistment intentions, respondents were asked a series of questions with respect to the achievement of life goals as well as a question about their level of satisfaction with the National Guard and Reserves.

The decision whether to re-enlist may be as complex as the decision to enlist. Presumably the individual considers many factors with respect to both types of decisions. Among other things, he may consider the degree to which certain life goals can be achieved in military service versus some non-military activity.

Respondents were shown 11 life goals, one at a time, and asked to rate whether each was more likely to be achieved in the military or in some non-military activity. Ratings were made on the following 5-point scale:

Scale Value

+1 = Much more likely in National Guard/Reserves
+2 = Somewhat more likely in National Guard/Reserves
+3 = Either National Guard/Reserves or some other non-military activity
+4 = Somewhat more likely in some other non-military activity
+5 = Much more likely in some other non-military activity

Table 7.4 presents the average ratings for the positive, negative and undecided propensity groups. The data can be summarized as follows:

1. Above all else, the positive propensity men saw Reserve Component service as enabling:

   -Serving your country

   but felt that a non-military activity slightly better allows a person to achieve:

   -Using hobbies and interests

2. As might be expected, the positive propensity men gave the Reserve Components better marks on all 11 life goals than the negative propensity group. Negative propensity men did not feel that any of the life goals were more achievable in the Reserve Components than in some non-military activity.

3. The greatest difference between the positive and negative propensity groups appears on "Earning extra income" where the positive group saw this goal as much more achievable in the National Guard/Reserves than did the negative group. This is an important finding in view of the fact that economics appear to be a major motivation for belonging to the Reserve Components as well as the fact that economic benefits and incentives may be used to enhance both accessions and retention.

4. The smallest differences between the positive and negative propensity groups are on "Obtaining good benefits" and "Recognition and Status".

5. The life goal ratings of undecided men were similar to those of the positive propensity group. The two groups differ with respect to only one life goal -- "Serving your community." Undecided respondents were more likely to feel that this life goal was more achievable in a non-military activity. At the same time, the undecided group differs with the negative propensity group on all but two life goals -- "Serving your community" and "Obtaining good benefits". Both groups perceived these two life goals to be more achievable in a non-military activity.

With respect to their overall satisfaction with the Reserve Components, the three propensity groups clearly differ from one another. As Table 7.5 shows, on the average, positive propensity guardsmen and reservists were the most satisfied, negative propensity men were the least satisfied and the undecided were most neutral as a group.

TABLE 7.4

ANALYSIS OF PROPENSITY TO RE-ENLIST IN THE RESERVE COMPONENTS

ACHIEVABILITY OF LIFE GOALS AVERAGE RATINGS

Life Goal	TOTAL	Positive Propensity	Negative Propensity	Undecided
Serving your country	2.5	1.8 [a]	3.0 [c]	2.3
Being a member of a team	3.0	2.3 [a]	3.5 [c]	2.7
Participate in exciting/ adventurous activities	3.3	2.6 [a]	3.9 [c]	3.1
Earning extra income	3.5	2.7 [a]	4.2 [c]	3.2
Making good friends	3.3	2.7 [a]	3.8 [c]	2.8
Serving your community	3.4	2.8 [ab]	3.9	3.5
Obtaining good benefits	3.3	2.8 [a]	3.7	3.3
Doing challenging work	3.6	3.0 [a]	4.2 [c]	3.0
Recognition and status	3.5	3.0 [a]	4.0 [c]	3.1
Developing your potential	3.8	3.1 [a]	4.4 [c]	3.5
Using hobbies and interests	4.0	3.3 [a]	4.5 [c]	3.8

*The scale used was:

1 = Much more likely in National Guard/Reserves
2 = Somewhat more likely in National Guard/Reserves
3 = Either National Guard/Reserves or some other non-military activity
4 = Somewhat more likely in some other non-military activity
5 = Much more likely in some other non-military activity

Therefore a <u>smaller</u> value indicates relatively greater Reserve Component likelihood

[a] Positive and negative propensity groups differ significantly

[b] Positive and undecided propensity groups differ significantly

[c] Negative and undecided propensity groups differ significantly

TABLE 7.5

ANALYSIS OF PROPENSITY TO RE-ENLIST
IN THE RESERVE COMPONENTS

LEVEL OF SATISFACTION
WITH RESERVE COMPONENTS

	TOTAL %	Positive Propensity %	Negative Propensity %	Undecided %
Very satisfied (1)	9.7	19.7	2.8	9.1
Somewhat satisfied (2)	29.5	55.3	9.3	36.4
Neither satisfied nor dissatisfied (3)	13.4	9.2	13.0	24.2
Somewhat dissatisfied (4)	21.7	11.9	28.7	21.2
Very dissatisfied (5)	25.7	3.9	46.2	9.1
Average	3.2	2.3 [ab]	4.1 [c]	2.9

---

[a] Positive and negative propensity groups differ significantly

[b] Positive and undecided propensity groups differ significantly

[c] Negative and undecided propensity groups differ significantly

SECTION VIII

Perceptions of Eleven Reserve Component Attributes

Section III discussed the fact that the ultimate success of efforts aimed at increasing accessions is contingent, in part, on the importance individuals attach to various characteristics of Reserve Components service as well as what they perceive to be the current or actual levels of these characteristics. This same logic applies to the issue of personnel retention. In this section perceptions are discussed. Section IX discusses the relative importance of attributes.

8.1 Current Perceptions of the Reserve Components

Prior to the trade-off portion of the interview where respondents indicated their preferences for varying combinations of attributes, reservists and guardsmen were asked to indicate what they believed to be the current level for each of 11 attributes in the study. The 12th attribute, annual training, was addressed in another question in which the respondent was asked to describe his own situation with respect to the timing and compensation for summer camp. This issue was discussed in Section VI.

In general, guardsmen and reservists have a much higher level of correct perception with respect to the Reserve Components than the NPS respondents. This is not surprising in view of the much greater experience these men have had with the actual conditions.

Table 8.1 summarizes the level of correct and incorrect perceptions for each of the attributes. The following conclusions can be drawn from this table.

1. Overall, when unit meetings are held, hair regulations and re-enlistment bonus have the highest levels of correct perception.

2. Pay for grades E-4 and E-5 (asked only of those in these grades) and PX/BX/Commissary have the lowest levels of correct perception. The relatively high level of misperception related to pay may be a result of having used approximations to actual levels, or may be due to differences caused by year in grade.

3. A relatively high proportion of men consider three attributes to be at levels considerably more favorable than what is actually now offered: tax on pay, PX/BX/Commissary privileges and educational assistance.

4. These data suggest that most guardsmen and reservists are quite well informed about what the Reserve Components presently offer. Efforts aimed at increasing retention should be concentrated, therefore, on first providing an enhanced product, rather than on product communication.

TABLE 8.1

PERCEPTIONS OF RESERVE COMPONENTS
ON ELEVEN ATTRIBUTES

Said This Attribute Level Best Describes the Reserve Components	TOTAL %
When unit meetings are held:	
1 session/month taking 2 days in one weekend	90.3
2 sessions/month taking 2 different Saturdays	1.8
3 sessions/month taking 1 Saturday and 2 weekend evenings	7.9
Hair regulations:	
No regulations on hair length	1.8
Your hair must look short for meetings; short haired wigs o.k.	89.4
Your hair must be short. No wigs permitted	8.8
Re-enlistment bonus:	
$3,000	3.2
$1,000	3.7
$ 300	6.0
None	87.1
Retirement:	
Retirement after 20 years of service and receive about $235/month plus benefits at age 60	83.3
Retire after 30 years of service and receive about $235/month plus benefits at age 50	14.8
Receive no retirement pay or benefits	1.9

Boxed entries indicate current level of such attribute.

Data are shown for the total sample only, since there are few statistically significant differences among propensity groups as would be expected.

TABLE 3.1 (cont'd)

Said This Attribute Level Best Describes The Reserve Components	TOTAL %
Hours of meetings each month:	
12	5.5
[16]	[82.0]
20	6.9
24	5.6
Length of re-enlistment:	
[1 year]	[75.1]
[3 years]	10.1
6 years	14.8
Tax on pay:	
Military pay is tax free	28.6
[Military pay is not tax free]	[71.4]
Educational Assistance:	
100% coverage of educational costs up to $1,000 per year for 4 years	18.4
100% coverage of educational costs up to $500 per year for 4 years	6.0
50% coverage of educational costs up to $500 per year for 4 years	6.0
[None]	[69.6]
What is done at unit meetings:	
50% military training; 50% community service	11.5
75% military training; 25% community service	20.3
[100% military training]	[68.2]

Boxed entries indicate current level of each attribute

Data are shown for the total sample only, since there are few statistically significant differences among propensity groups as would be expected.

TABLE 8.1 (cont'd)

Said This Attribute Level Best Describes The Reserve Components	TOTAL %
E-4 Pay; 4-6 years service: *	
$1,749 per year	17.5
$1,399 per year	18.6
[$1,166 per year]	[39.2]
$ 933 per year	24.7
E-5 Pay; 4-6 years service: *	
$1,344 per year	6.9
$1,475 per year	16.1
[$1,299 per year]	[56.3]
$ 983 per year	20.7
E-6 Pay; 4-6 years service: *	
$2,032 per year	-
$1,626 per year	17.2
[$1,355 per year]	[69.0]
$1,084 per year	13.8
PX/BX/Commissary privileges:	
Available all the time for self and family	25.3
[Available when on duty for self and family]	[44.7]
Available when on duty for self only	30.0

Boxed entries indicate current level of each attribute.

Data are shown for the total sample only, since there are few statistically significant differences among propensity groups as would be expected.

* Asked only of those respondents in the grade.

SECTION IX

Trade-Off Analysis of Reserve Component Attributes

In this section a mathematical and psychological model of Reserve Components re-enlistment intentions is discussed. This model is similar to that discussed with respect to NPS civilian males in Section IV.

9.1 Some Background On Re-enlistment Intentions

The data presented in this section are based on the same trade-off procedure used to estimate civilian accessions. In studying re-enlistment, however, we are not attempting to estimate the actual number of re-enlistments. To do this would have required that we directly relate the attitudinal data derived from this study with actual re-enlistment data. This was done to estimate accessions using actual enlistment data provided by the Department of Defense. With respect to re-enlistments, however, actual data were not available. Hence, the dependent measure or basic result is stated likelihood of re-enlisting only. These are reported as numbers with values of .0 to .9. These numbers have meaning only in a relative sense; the higher the number, the greater is the relative likelihood of re-enlisting. These numbers cannot be used to estimate actual number of re-enlistments.

9.2 Sensitivity Analysis of Attributes

Table 9.1 shows a sensitivity analysis of the attributes. The attributes are listed in descending order of their relative importance with respect to impacting on likelihood of re-enlisting. The numbers in the right-hand columns represent average likelihood of re-enlisting and percent changes in the likelihood measure. Because these numbers reflect stated likelihood of re-enlisting, these numbers have been labeled as being indices of potential for increasing re-enlistment intentions.

The following conclusions can be drawn from Table 9.1:

1. A re-enlistment bonus of $3,000 and 100% educational coverage; $1,000 for each of 4 years are likely to have the greatest positive impact on re-enlistment intentions.

2. Other economic attributes such as pay (50% over current level) and tax deductions as well as 1 year extensions of service also appear to be important factors in making a decision to re-enlist.

3. Factors related to the impact of Reserve Component membership on lifestyle such as timing of annual training, hair regulations and length of meetings per month appear to be of relatively little importance in the re-enlistment decision for guardmen and reservists.

4. The most important attributes with respect to enhancing re-enlistment intentions appear to be similar to those that are likely to have the largest impact on accessions of NPS men.

TABLE 9.1

SENSITIVITY ANALYSIS

Attribute	Level	Potential for Increase In Re-enlistment Intentions: Average Likelihood	% Change
Current Product	Actual levels of the 12 attributes	.476	-
1. Re-enlistment Bonus	$3,000	.794	+67
	$1,000	.694	+46
	$ 300	.595	+25
2. Educational Assistance	100% coverage; $1,000 for each of 4 years	.768	+61
	100% coverage; $500 for each of 4 years	.682	+43
	50% coverage; $500 for each of 4 years	.597	+25
3. Federal Income Tax Deduction	Military pay is tax free	.642	+35
4. Extension of Service	1 year	.636	+34
	6 years*	.349	-27
5. Pay for Current Grade	50% over current level	.634	+33
	25% over current level	.546	+15
	20% below current level*	.404	-15
6. Annual Training	Summer camp taken during vacation. Receive military and civilian pay.	.586	+23
	Summer camp taken not during vacation. Receive military and civilian pay	.569	+20
	Summer camp taken not during vacation. Receive only civilian pay	.516	+ 8

* Lower than current level

TABLE 9.1 (cont'd)

	Attribute	Level	Potential for Increase In Re-enlistment Intentions: Average Likelihood	% Change
7.	PX/BX/Commissary Privileges	Available all of the time for entire family	.534	+12
8.	Hair Regulations	None	.530	+11
		Must be short*	.395	-17
9.	Hours of Meetings Each Month	12 hours	.524	+10
10.	What is Done At Unit Meetings	50% military training/50% community service	.498	+ 5
		75% military training/25% community service	.497	+ 4
11.	When Unit Meetings Are Held	2 sessions/month taking 2 different Saturdays*	.378	-21
		3 sessions/month taking 1 Saturday and 2 weekday evenings*	.374	-22
12.	Retirement	Retire after 30 years of service and receive about $235/month plus benefits at age 50*	.400	-16
		Receive no retirement pay or benefits*	.270	-43

*Lower than current level

Table 9.2 shows the estimated impact on re-enlistment intentions of four of the five most important attributes.

The following conclusions can be drawn:

1. Within each demographic group, the relative impact on re-enlistment intentions of each level of each attribute tends to parallel the corresponding impact on the total sample of guardsmen and reservists.

2. Within each attribute, there appears to be some discrimination among demographic groups in terms of absolute impact on re-enlistment intentions. Virtually every level of all four attributes appear to have a larger impact on Whites than on Non-Whites.

   The most favorable levels of re-enlistment bonus has a larger impact on white collar men than on their blue collar counterparts.

9.3 Resultant Impact of Combining Attributes

Although accessions and re-enlistments represent two different problems, similar strategies might be used to address both of these issues. This might offer logistic and economic efficiencies. With this hypothesis in mind, the re-enlistment equivalent of the 12 hypothetical products created for NPS men, and discussed in Section IV, are shown in Table 9.3. These products differ slightly from the NPS products in two ways. First, pay is expressed as percent increases over the current pay level rather than dollars per hours. The other difference is that extension of service is one year rather than an enlistment of four years.

As in the case of NPS men, the Department of Defense may wish to simulate additional cominbations of attributes.

TABLE 9.2

POTENTIAL FOR INCREASE IN RE-ENLISTMENT INTENTIONS: SELECTED ATTRIBUTES BY KEY DEMOGRAPHIC GROUPS

		Attribute*								
		Re-enlistment Bonus			Educational Assistance			Term	Pay	
	Current Product**	$3,000	$1,000	$300	100%($1,000)	100%($500)	50%($500	1 yr.	Up 50%	Up 20%
TOTAL SAMPLE	.476	+67%	+46%	+25%	+61%	+43%	+25%	+34%	[illegible]	+15%
Race										
White	.459	+74%	+50%	+27%	+67%	+48%	+28%	+39%	+38%	+17%
Non-White	.529	+48%	+33%	+19%	+46%	+30%	+19%	+19%	+19%	+9%
Occupation										
White Collar	.442	+74%	+49%	+24%	+67%	+45%	+26%	+38%	+35%	+15%
Blue Collar	.508	+64%	+45%	+26%	+58%	+42%	+26%	+29%	+33%	+14%
Location										
Large Urban	.462	+70%	+48	+25%	+65%	+46%	+27%	+3[illegible]%	+34%	+15%
Small Urban	.518	+58%	+40%	+24%	+51%	+36%	+21%	+30%	+30%	+13%
Pay Grade										
E-4	.506	+63%	+45%	+26%	+60%	+43%	+26%	+30%	+32%	+13%
E-5	.441	+71%	+47%	+25%	+65%	+45%	+26%	+36%	+34%	+17%
E-6/7	.496	+67%	+46%	+22%	+57%	+37%	+22%	+34%	+34%	+14%

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* Data are shown as percent increases in likelihood over current (base) product.

** Data are shown as average likehoods

Boxed entries indicate percent increases in re-enlistment intentions that are 10 or more percentage points higher than other percent increases shown for the particular level of the attribute.

Table 9.3 shows the estimated impact of these hypothetical products on re-enlistment intentions of key demographic groups.

The following conclusions can be drawn from Table 9.3.

1. Product #1 -- the combination of educational assistance amounting to 100% coverage; $500 for each of 4 years and a re-enlistment bonus of $1,000 is likely to have the largest impact on re-enlistment intentions in total as well as each demographic group.

2. Rather than offer both educational assistance and a bonus in addition to a short extension of service, offering more favorable educational assistance in lieu of a bonus (Product #4) or a higher bonus in lieu of educational assistance plus a one year extension of service are likely to produce results comparable to Product #10.

3. All three products (#4, #7, #10) are likely to produce results greater than any single attribute modification.

4. Except for Products #3, #6, and #9, these hypothetical products reflect the fewest number and perhaps least potentially expensive combination of attributes that achieve approximately the same results as the single most powerful benefit (an enlistment bonus of $3,000 ... +67% increase likelihood of re-enlistment.)

5. All of the hypothetical products have considerably greater impact on the re-enlistment intentions of Whites than on Non-Whites. Most of the hypothetical products that include some modification in educational assistance appear to have more impact on men living in large urban areas as opposed to smaller areas.

TABLE 9.1

POTENTIAL FOR INCREASE IN RE ENLISTMENT INTENTIONS AS A RESULT OF COMBINING SELECTED ATTRIBUTES BY KEY DEMOGRAPHIC GROUPS

		Modified Products*					
	(1)	(2)	(3)	(4)	(5)	(6)
Attribute: Education:	100% ($500)	100% ($500)	100% ($500)	100% ($500)	50% ($500)	50% ($500)
Bonus:	$1,000	$300	----	----	$1,000	-----
Pay:	----	----	Up 20%	----	----	Up 50%
Term:	----	----	----	1 yr.	----	-----
TOTAL SAMPLE	+77%	+62%	+55%	+70%	+66%	+55%
Race						
White	[+83%]	[+67%]	[+61%]	[+79%]	[+71%]	[+61%]
Non-White	+62%	+47%	+40%	+48%	+52%	+40%
Occupation						
White Collar	[+85%]	+66%	+60%	[+77%]	+72%	+59%
Blue Collar	+74%	+61%	+54%	+67%	+64%	+55%
Location						
Large Urban	[+83%]	[+65%]	[+58%]	+71%	[+70%]	[+58%]
Small Urban	+66%	+53%	+47%	+67%	+56%	+48%
Pay Grade						
E-4	+71%	+60%	+59%	+66%	+62%	+54%
E-5	[+85%]	+66%	+58%	[+77%]	+70%	+56%
E-6/7	+67%	+58%	+51%	+64%	+65%	+85%

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* Data are shown as percent increases in likelihood over current (base) product.

Boxed entries indicate percent increases in re-enlistment intentions that are 10 or more percentage points higher than other percent increases as shown for the particular level of the attribute.

APPENDICES

TABLE 9.3 (cont'd)

Attribute		Modified Product* (7)	(8)	(9)	(10)	(11)	(12)
	Education:	---	---	50%($500)	50%($500)	50%($500)	---
	Bonus:	$1,000	---	$300	$300	---	$300
	Pay:	---	Up 50%	Up 20%	---	Up 20%	Up 20%
	Term:	1 yr.	1 yr.	---	1 yr.	1 yr.	1 yr.
TOTAL SAMPLE		+71%	+62%	+59%	+73%	+68%	+65%
Race							
White		+80%	+71%	+64%	+81%	+76%	+74%
Non-White		+49%	+37%	+45%	+53%	+47%	+42%
Occupation							
White Collar		+77%	+67%	+62%	+78%	+74%	+70%
Blue Collar		+69%	+60%	+59	+71%	+65%	+64%
Location							
Large Urban		+72%	+62%	+62%	+74%	+69%	+66%
Small Urban		+68%	+61%	+51%	+70%	+65%	+64%
Pay Grade							
E-4		+66%	+60%	+57%	+68%	+65%	+62%
E-5		+77%	+64%	+61%	+80%	+73%	+69%
E-6/7		+72%	+63%	+58%	+71%	+64%	+65%

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* Data are shown as percent increases in likelihood over current (base) product.

Boxed entries indicate percent increases in accessions that are 10 or more percentage points higher than other percent increases shown for the particular level of the attribute.

APPENDIX I

SAMPLING PLAN

Rationale for Quota Sampling

There are two major considerations in sampling--the nature of the sample and the acquisition of the sample. While these are two distinct issues, the nature of the sample can have a significant influence on the acquisition of respondents. This was the case in the present study.

Previous research (e.g., Youth Attitude Tracking Study) indicated that three demographic variables appear to be most important with respect to propensity to join the military:

Race: White
Non-White

Age: 17-18
19-20
21-26

Highest Education: Non-graduate of high school (currently in school)
Non-graduate of high school (not currently in school)
High school graduate
Some college (but not a graduate)

Accordingly, it was essential that the sample for the present study contain adequate numbers of people who belong to each of the above demographic categories. While the use of ordinary random sampling procedures would have been desirable for purposes of sample representativeness and statistical analyses, such procedures were not feasible. A simple random sample large enough to meet the above sample requirements would have been prohibitively costly. Market Facts' experience with the Youth Attitude Tracking Study indicates that approximately one-in

fifty households contacted using a telephone random sampling procedure has a respondent meeting a demographic profile similar to the sample profile for the present study. In the present study this ratio would have been even smaller, because of the requirement that respondents be brought to a central interviewing facility and interviewed in person.

Time constraints also obviated using a random sampling procedure. The Department of Defense's needs made it mandatory that the project be completed by Fall, 1977. Finally, respondents were interviewed by a computer-based interactive system. This technique maximizes the quality of the interviewing situation as well as the quality of the data. On the other hand, it was logistically not feasible to use this technique with a truly randomly selected sample of respondents.

These restrictions on the use of a random sampling procedure made it necessary to use a quota sampling procedure in this project.

It was our desire to provide estimates of uncertainty surrounding parameters estimated for the data, which was more difficult due to the special structure of the sample. On the one hand the homegeneous nature of the subgroups studied insured that biases due to the nonrandom sampling of respondents would be smaller than they might be otherwise; but sampling theory cannot by itself accurately estimate uncertainty levels. We therefore provided uncertainty estimates based on judgment which was in all cases at least as conservative as those computed using available statistical theory.

Sample Structure and Quotas

Respondents were drawn according to the following disproportionate sampling plan:

Demographic Variable	Level	Quota No.
Race:	White	700+
	Non-White	200+
Age:	17-18	200+
	19-20	200+
	21-26	200+
Education:	Non-High School Grad. (Currently in School)	200+
	Non High School Grad. (Not Currently in School)	200+
	High School Grad.	200+
	Some College (But not Graduate)	

A proportionate sampling procedure was used with respect to geographic markets. A quota was established for each of the nine markets that roughly corresponded to each market's percent of the total sampling universe. As a result, considerably more interviews were conducted in Chicago, Boston and San Francisco than were obtained in the smaller cities.

Acquisition of Respondents

Because the civilian respondent sample was highly structured on basic demographic variables, the respondent recruitment task was potentially of considerable difficulty.

Quota sampling respondents who met the demographic requirements of this study necessitated that respondents be acquired through a variety of courses. While such sampling is relatively unstructured, Market Facts made every effort to provide some degree of structure to representing the diversity of viewpoints.

In each of the nine markets, Market Facts' field supervisors' in conjunction with local independent field supervisors, contacted the following types of local organizations:

- Boy's clubs
- Religious youth organizations
- Jaycees
- Faculty advisors and counselors of school and campus organizations and clubs
- Community youth centers

In order to contact young men who were **not affiliated** with any organization, the field staff also conducted on-site screening/recruiting at locations frequented by young men. These included such places as the following:

- State employment agencies/public assistance offices
- Industrial plants
- Construction sites
- Fast food restaurants
- Bowling establishments
- Public beaches/parks
- Shopping centers

The feasibility of these locations was contingent on gaining approval by those in-charge at each location. On-location screening/recruiting was conducted during peak hours by interviewers specially trained as recruiters, who were capable of building immediate rapport with potential respondents.

Following the initial contact, all respondents were recontacted by a letter on Market Facts' letterhead listing the appointment dates, time and location (illustrated with an accompanying map). The letters were signed by the president of Market Facts which assured the respondent of the study's validity as well as make him feel important. Respondents

obtained through on-site recruiting also were recontacted by telephone for an appointment or confirmation of an appointment.

No more than two people from any one organization and no more than six people from any one on-site location were allowed to participate in this study. A respondent could refer one other respondent. The referred-respondent could not in-turn refer another respondent. All respondents were paid $5 as an incentive. Respondents who referred a respondent received an additional $2.50.

APPENDIX I.

WEIGHTING OF RESPONDENTS

The use of quota sampling leads naturally to a study design in which the numbers of respondents with certain demographic characteristics (in terms of age, race and education) are disproportionate to their actual numbers in the total U.S. population. Accordingly, a respondent weighting procedure was used to make the sample of NPS civilian males correspond to actual census levels in terms of age and race.

Specifically, 12 age-race weights were developed based on census data for six age categories (i.e., 17, 18, 19, 20, 21 and 22-26) and two racial categories (i.e., White and Non-White). Education census data were not available and, therefore, not used in developing respondent weights. The weighting constant for each cell was simply the product of the appropriate age weight and race weight.

APPENDIX III

STATISTICAL RELIABILITY

Because respondents are weighted unequally it is not correct to assess standard errors by methods which would be appropriate with unweighted data. A similar problem occurs in the series of Youth Attitude Tracking studies (Market Facts, Inc.; Fall 1975, Spring 1976, Fall 1976, Spring 1977, and Fall 1977). In these studies, standard errors are computed using a replicated sample procedure developed by W. E. Deming for use with weighted data (Proceedings of the ASQC, June 5, 1961). Standard errors estimated in this way average 10 percent greater than those obtained by applying the procedures ordinarily used with unweighted data. These more conservative estimates of standard errors seem appropriate for the present study.

The accompanying tables provide 95 percent confidence and intervals for percentages observed in this study which are ten percent larger than those obtained by ordinary methods.

STATISTICAL RELIABILITY FOR DETERMINING ACCURACY OF PERCENTS WITHIN A SINGLE SAMPLE*

At the 95% level of confidence

Sample Size	Magnitude of Expected or Observed Percent				
	10% 90%	20% 80%	30% 70%	40% 60%	50% 50%
100	6.4	8.7	9.8	10.6	10.8
200	4.8	6.2	6.9	7.5	7.6
400	3.3	4.3	5.0	5.2	5.4
600	2.6	3.5	4.1	4.3	4.5
1000	2.1	2.8	3.1	3.3	3.4
2000	1.4	2.0	2.2	2.4	2.4
2600	1.3	1.7	2.0	2.1	2.1
3000	1.2	1.6	1.8	2.0	2.0

* Not to be used for comparing observations from different groups of respondents

** Observed percent ± the appropriate number shows by how much the observation could vary due to sampling error

STATISTICAL RELIABILITY FOR COMPARING PERCENTS BETWEEN TWO INDEPENDENT SAMPLES*

At the 95% level of confidence

Size of Each Sample	Average of the Two Observed Percents				
	10% 90%	20% 80%	30% 70%	40% 60%	50% 50%
100	9.2	12.2	14.0	14.9	15.2
200	6.4	8.7	9.8	10.6	10.8
400	4.6	6.2	6.9	7.5	7.6
600	3.7	5.0	5.8	6.2	6.3
1000	2.9	3.8	4.5	4.7	4.9
2000	2.1	2.8	3.1	3.3	3.4
2600	1.8	2.4	2.8	2.9	3.0
3000	1.7	2.2	2.5	2.8	2.8

* Not to be used for measuring accuracy of percents within a single sample

** Minimum difference required between the observed percents in the two sampled populations to be statistically different

APPENDIX IV

TRADE-OFF ANALYSIS

The Trade-Off Model

Any important choice that an individual makes almost always requires that he consider trade-offs among desirable alternatives. For instance, when choosing among possible jobs it is seldom, if ever, possible for the individual to find a single job possibility which embodies all of his favored characteristics. Consequently, he must decide which characteristics he is willing to forego in order to obtain certain others. To specify just two such types of consideration, high pay is usually paired with longer hours and different employers offer different benefit plans. Trade-Off Analysis is a technique designed specifically to deal with such situations.

The technique assumes that an occupational activity--in the present case serving in the Reserves or National Guard, -- can be characterized, as being composed of certain specified attributes, or more accurately, attribute levels. (The attributes and levels used in this study are presented in the Introduction to this report.) It further assumes that every individual has a utility value (relative importance) associated with each of the levels of each attribute and that it is possible to determine an individual's overall utility for a product by combining in some way his utilities for each level of each attribute characterizing the product. The "composition rule" used in this study is multiplicative. That is to say, the overall utility for a product is assumed to be the product of the utility values for the appropriate attribute levels.

The numerical utility values characterizing the underlying preferences of any individual may be inferred from preference data provided by the individual. Respondents in this study were presented with a series of paired comparison questions which required them to

trade-off among the various levels of the attributes. These questions were of the form: "All other aspects of the Reserves and National Guard programs being equal, would you prefer:

no enlistment bonus & pay 50% above the current level	(or)	$300 enlistment bonus & pay 20% above the current level"

The interactive interviewing method used permitted the computer to present to each respondent a series of questions of this type, each one of which was selected on the basis of his responses to earlier questions. It therefore yielded more information about his utilities than would otherwise have been possible.

A computer program estimated each respondent's utilities from these responses, using an iterative maximum likelihood procedure. This procedure seeks to maximize a likelihood criterion which is the product of the N estimated likelihoods of the respondent's actual responses, conditioned upon his utilities. Also computed for each individual is a measure of goodness of fit known as tau and calculated as follows: $\text{tau} = \frac{Pc - Pi}{Pc + Pi}$, where Pc is the number of pairs for which the calculated utilities can correctly reproduce the respondent's choice on that pair and Pi is the number of pairs for which his choice is "predicted" incorrectly. Thus, for instance, a tau of .70 corresponds to the case in which the model correctly reproduces 85% of a respondent's choices.

Trade-Off Analysis presents several distinct advantages over other methods typically employed to treat attitudinal data. Traditional measures do not permit adequate quantification of the acceptability of products or programs not presented in the original questionnaire. By the multiplicative composition rule, Trade Off Analysis can assess the acceptability of any program defined by specified levels of the attributes studied. Since this analysis is conducted at the individual level, it is possible to obtain information about acceptability for any desired grouping of individuals, such as those living in small urban areas or those holding white collar jobs.

By themselves, the utilities calculated in the manner described above are expressions of preference, not propensity. That is to say, they provide the capability of demonstrating an individual's relative preference for one possible Reserve program over another, but they do not indicate his absolute likelihood of actually joining the preferred program. By means of a four stage process, however, it is possible to relate these utilities to other estimates of actual likelihoods of enlisting and finally to estimated accession levels for hypothetical packages of service characteristics.

This process depends upon the relationship of four key variables:

$$AU_{xij} \rightarrow OU_{xj} \rightarrow R_{xj} \rightarrow A_x$$

where AUxij : respondent j's utility for the level of Program X on attribute i

OUxj : respondent j's overall utility for Program X

Rxj : respondent j's rating of his perceived likelihood of enlisting, if offered Program X

Ax : estimated accessions to Program X

The relationships among these variables and the estimation of key parameters are described below.

Obtaining Attribute Exponents

The overall utility of respondent j for Program X is estimated multiplicatively in the following way:

$$OU_{xj} = AU_{x1j}^{B1} \times AU_{x2j}^{B2} \times \ldots \times AU_{xnj}^{Bn}$$

$$= \prod_{i=1}^{n} AU_{xij}^{Bi}, \quad \text{where } n \text{ is the number of attributes describing}$$

x. The exponents, Bi, adjust for possible perceived redundancy or lack of independence among the attributes, and are assumed to be the same for all respondents.

Estimates of these exponents were obtained in the following manner. Each respondent was presented with 12 concepts of possible Reserve or National Guard programs which were described in terms of the attributes studied, and which he was asked to rank order in terms of his preference. Least squares regression analysis was then used to provide an equation predicting a respondent's rank order for any concept from his utilities.

The model used was

$$RO_q = b_1 \ln AU_{q1} + b_2 \ln AU_{q2} + \ldots + b_n \ln AU_{qn}$$

where RO_q is the rank order of concept Q. Each respondent supplied 12 observations to the analysis, one for each concept he ranked. Because his mean on each of the variables was removed before entering the analysis there was no intercept term in the regression. The regression weights thus obtained were arbitrarily scaled so that the largest was unity and the resulting numbers, one for each attribute, were then applied to the appropriate attribute utilities as exponents. Exhibit I displays the exponents used for each sample.

Exhibit I

ATTRIBUTE EXPONENTS

Attribute	No Prior Service Civilians	Current Reservists and Guardsmen
Pay	.917	.597
Term	1.000	.747
Bonus	.960	1.000
Education	.912	.646
Tax	.856	.785
PX Privileges	.473	.316
Hair Regulations	.964	.734
No. Meeting Hrs.	.329	.574
No. Sessions/Mo.	.704	.751
Duties	.546	.475
Training Camp	.579	.644
Retirement	.794	.969
Branch	.752	n. a.

Obtaining Likelihood Estimates from Utilities

Each respondent estimated his likelihood of enlisting if offered the programs represented by four concepts: his two highest and two lowest ranked descriptions of possible Reserves or National Guard Programs.

Each concept was rated on the scale shown in Exhibit 2. (For obvious reasons, any respondent giving four identical ratings was deleted from further analysis.) The respondent's ratings were first transformed by means of the equation $T_{qi} = \frac{13-R_{qj}}{13}$ where R was his rating of Concept Q on the 12-point scale, and T_{qj} was the transformed rating.

For each person a four-observation regression was then performed using the following model:

$$\ln T_{qj} = a + b \ln OU_{qj}$$

The purpose of this regression was to scale each respondent's utilities in such a way as to relate them to his estimated likelihoods of enlistment as expressed by the scale ratings. This step was necessary because utilities are derived from data in which respondents compare the relative attractiveness of collections of attribute levels. Two individuals with similar patterns of preference would have similar utilities even though they had different likelihoods of enlistment.

By estimating these two parameters for each individual and scaling his utilities accordingly, this element of indeterminacy is removed from the data. Each respondent's utilities are made comparable in the sense that his overall utility for each of the rated concepts is set as nearly as possible to the transformed value of his rating for that concept.

The distribution of r^2 for this regression is shown for both samples in Exhibit 3. All respondents not meeting three criteria were excluded from further analysis:

1. Parameter b, above, greater than zero. (This requires that a respondent have higher enlistment likelihoods for those concepts with higher utilities.)

2. r^2 greater than or equal to .25. (This ensures a minimum degree of relationship between utilities and likelihoods.)

3. ρ_{xy} greater than or equal to .70. (This specifies a minimum standard of fit of the respondent's utilities to his preference data.)

The a and b parameters obtained in the regression just described were then used to relate utility estimates to likelihood rating estimates by the equation.

$$T_{xi} = e^{a} \, OU_{xj}^{b}$$

EXHIBIT 2

"Likelihood of Enlisting" Rating Scale and Distribution of Ratings

Wording Given	Numerical Rating	No. of Respondents Giving Rating	Percentile of Rating	Estimated Percentile
	1	84	.992	.994
"Definitely"	2	63	.979	.976
	3	89	.965	.946
	4	265	.933	.905
"Probably"	5	369	.875	.852
	6	428	.803	.787
	7	585	.711	.710
"Probably Not"	8	476	.615	.621
	9	695	.508	.520
	10	450	.404	.408
"Definitely Not"	11	413	.326	.284
	12	1587	.144	.148

EXHIBIT 3

Distribution of r^2

Sample \ r^2	.10	.20	.30	.40	.50	.60	.70	.80	.90	1.0
No Prior Service Civilians	39	32	32	50	76	110	126	169	304	250
Current Reservists and Guardsmen	10	6	6	10	7	17	16	22	46	39

Linking Estimated Likelihoods to Estimated Accession Levels

A likelihood estimate T_{xj} obtained in this manner was not assumed to be an actual likelihood in any probabilistic sense of the word. Rather, it was interpreted merely as an estimate of the respondent's transformed rating T on the 12-point scale described in Exhibit 2. Inspection of Exhibit 2 shows that most of the actual ratings were concentrated in the lower end of the scale. Because it appeared desirable to "spread out" the scale in this region, and because there seemed to be little reason to believe that respondents were able to estimate likelihoods in more than an ordinal sense, the decision was made to treat the likelihood scale as a merely ordinal scale. Accordingly, percentile points were estimated for each of the 12 scale positions and these values were used to represent the likelihood corresponding to each scale point.

For subsequent computations it was necessary to express these percentiles as a function of the underlying rating scale values rather than to compute actual percentiles. The estimating function found was

$P_{xj} = 1 - (1 - T_{xj})^2 = 1 - \frac{R_{xj}^2}{169}$, where R_{xj} is the rating on the one-to-twelve scale. The values of this function for each of the scale points are shown in the last column of Exhibit 2.

The final step in the prediction of accession levels is based on an additive aggregation of these P estimates, each multiplied by a respondent weight which relates estimated accessions among the sample group to accessions for the total population.

$$A_x = W_1 P_{x1} + W_2 P_{x2} + \ldots + W_m P_{xm}$$

$$= \sum_{i=1}^{m} W_i P_{xi}, \text{ where } m \text{ is the number of respondents and } W_i$$

is the weight for respondent i.

In order to obtain these weights, an initial simulation was performed for the NPS civilian sample in which all respondent weights were set at 1.0. Estimated accessions to the program as currently described were tabulated by each of 12 age-race groups and these figures were compared with actual December - June 1977 accession levels for these groups. The latter figures were supplied by MARDAC. Comparison of these numbers made possible the specification of 12 age-race weights, one of which was applied to each respondent in subsequent simulations on the basis of his membership in one of the 12 groups. No similar figures for re-enlistments were available for use in the current reservists and guardsmen sample; hence, all simulations involving that sample utilize respondent weights of 1.0.

Once weighting factors are obtained, accession levels for any hypothetical Reserves and National Guard program can be estimated. It is only necessary to specify the attribute levels which characterize the program of interest. The resulting accession estimates are presented both in their raw form (the actual estimates for that program) and as percentage deviations from accession levels to the current program.

Such estimates can be made separately for any demographic groups about which data were collected in the study. Thus it is possible to determine which programs have the greatest effect in increased accessions among the highly educated, among good students, among whites, among 20-year olds, and so on.

A numerical example of the processes described in this Appendix may be found in the study proposal. The project staff of Market Facts would like to acknowledge the substantial contribution of Dr. James Ginter in conceptualizing the foregoing steps.

Glossary of Terms

AU_{xij} - respondent j's utility for the level of Program X on attribute i

OU_{xj} - respondent j's overall utility for Program X

$$OU_{xj} = \prod_{i=1}^{n} AU_{xij}^{Bj}$$, where n is the number of attributes characterizing X

R_{xj} - respondent j's rating on a 12-point scale (where 1 corresponds to his highest possible likelihood and 12 to his lowest possible) of his likelihood of joining X, if it were offered to him

T_{xj} - the transformation of j's rating of X

$$T_{xj} = \frac{13-R_{xj}}{13}$$

T_{xj} is estimated by the following equation

$$T_{xj} = e^{aj} OU_{xj}^{bj}$$

P_{xj} - the percentile point corresponding to respondent j's rating, R_{xj}, of Program X
P_{xj} is estimated by the equation

$$P_{xj} = 1 - (1-T_{xj})^2$$

W_j - the respondent weight for j

A_x - estimated accessions to X
A_x is estimated by the equation

$$A_x = \sum_{j=1}^{m} W_j P_{xj}$$, where m is the number of respondents

P_c - the number of paired comparison questions from the questionnaire for which a respondent's utilities can correctly reproduce his choice on the question. This value is used in calculation of tau

Glossary of Terms (continued)

Pi - the number of paired comparison questions from the questionnaire for which a respondent's utility cannot correctly reproduce his choice. This is also used in the calculation of tau

tau - a measure of how well a respondent's utilities fit his perference data

$$\text{tau} = \frac{Pc - Pi}{Pc + Pi}$$

ROx - the rank order expressing relative preference for concept X

Bi - an exponent applied to the utility for attribute i. These Bi are estimated by regression analysis using the model

$$RO_x = B_1 \ln AU_{x1} + B_2 \ln AU_{x2} + \ldots + B_n \ln AU_{xn}$$

aj, bj - a constant term and an exponent for respondent j which, when applied to utilities to likelihoods. The regression model providing these terms is

$$\ln T_{xj} = a_j + b_j \ln OU_{xj}$$